MADURAI KAMARAJ UNIVERSITY

(University with Potential for Excellence)

DIRECTORATE OF DISTANCE EDUCATION

M.Com.

(COMMERCE)

& M. Com. Co-operative Management

First Year

COMPUTER APPLICATION IN BUSINESS

Recognised by DEC

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S216/1053

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SYLLABUS - COMPUTER APPLICATIONS IN BUSINESS

INTRODUCTION

Unit I	:	**An Introdcution to Computer** - Meaning - uses of computer in the Modern Society - Elements of Computer Processing System - Hardware - CPU - Input / Output devices - Storage Devices - Software.
Unit II	:	**Management Information System** - Meaning - Role of MIS-Information Requirement at various levels of management - Data, Information and Communication.
Unit III	:	**Planning for MIS** - designing MIS - Importance of Management Information System.
Unit IV	:	**Data Processing** - identification, files, records, fields, character - Computer applications in business - Nature of computer application - Cost and Budgetary control - Stock control and sales, pay roll, banking, insurance, stock broking.
Unit V	:	**Introduction to Basic Language** - character - contents - variables - strings - statement - REM - LET - END - INPUT - Statements - READ statement - GOTO - ON GOTO - IF THEN - FOR TO NEXT statements - PRINT statements (Simple business problems only)
Unit VI	:	**Spread sheet** - Advantages of using spread sheets - entering data - label - number - formula in work sheets.
Unit VII	:	**Editing cells,** using commands and functions and saving work sheet.
Unit VIII	:	**Creating graphs**-using data and time, ranges, statistical, mathematical and financial functions.
Unit IX	:	**Word for windows** - Word basic - Formatting text and documents - work with headers, footers and foot notes - Tables and sorting - working with graphics, templates, wizards and sample documents.
Unit X	:	**Working with excel** - Excel basic - Rearranging work sheets - Excel formating tips and techniques - organising large projects.

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INTRODUCTION

The revolution in business caused by the internet and its related technologies shows that information systems and information technologies are essential for the success of business enterprises. With the rapidly charging technology, it is necessary to be in continuous touch of it. It handles data and information represented in digital, text, image, graphics or voice media and deals with communication, storage, processing and printing.

Many Universities have introduced Information Technology at different levels of education. In business, it is used for decision making. Therefore business students must learn how to use and manage a variety of information technologies to revitalise business processes.

A computer is an electronic device whose basic function is the execution of commands. A series of commands is known as a program. Now-a-days, a computer is not limited only to computation. It can also be used for writing letters, maintaining data base, listening songs, viewing movies etc. In this course we have discussed the application of computers to business.

UNIT 1 AN INTRODUCTION TO COMPUTERS

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Structure

1.1 Introduction
1.2 Unit Objectives
1.3 Meaning of Computer
1.4 Characteristics features of Computers
1.5 Classification of Computers
1.6 Uses of Computers in Modern Society
1.7 Key Terms
1.8 Summary
1.9 Answers to Check Your Progress
1.10 Questions / Exercises
1.11 Further Reading

1.1 INTRODUCTION

Early people in small groups wandered from place to place in search of food. They hunted animals and plucked fruits from trees for their sustenance. They had no contacts with other groups. And also, their needs and wants were limited. Slowly, they learnt the methods of agriculture. They domesticated some animals and made use of them for various purposes. As days passed by, the needs of mankind increased. This necessitated them to deal with other people and also with small amount of information.

As civilisation grew, their possessions and dealings with others considerably increased. Many calculations had to be done for various purposes. This was the primary reason for them to invent a machine that world store information and make calculations. After years of continuous research, man was able to construct the 'COMPUTER' a calculating machine.

With the advent of Computer, world has now become oneness. It has been occupying in all of our activities. It has become a part of our life. As such, everyone has to acquire computer knowledge to face this modern world. Even at primary level of education, children are given computer education. All business activities are being undertaken through computers. A man to compete with the present world must posses computer knowledge. Without computer knowledge, he cannot face the world. This will become a reality very soon.

Computers have been installed in industries to operate machines and to control quality of products. Business people use them for accounting, invoicing, stock control and payroll preparation. Railways and Air Corporations have employed computers to book reservations. Computers have got a major role in diagnosing diseases in hospitals. They keep records about the patients.

1.2 OBJECTIVES

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After going through this unit, you will be able to:

- describe the characteristic features of computers
- list the various classification of computers
- explain the uses of computers in the modern society.

1.3 MEANING OF COMPUTER

In the literal sense, Computer is a device that calculates. Initially the computer was designed to perform certain arithmetic operations. It dealt with numbers only. However, the present day computer can process both symbols and numbers. Therefore, the literal interpretation of the word 'computer' is something a misnormer. In deed, the computer can read input data, transfer data, store data and retrieve data, test data by logical operations and provide results.

In this context, computer is defined as "A high speed electronic machine that accepts input data, manipulates them and produces desired result as output". Thus a computer is an electronic device with the ability,

- to accept data and instructions by the users.
- to transfer or move data
- to store and retrieve data
- to perform arithmetic and logical operations and
- to produce desired results in the desired form

Thus a computer is an electronic instrument which has the above capabilities. These capabilities are usually called input, processing memory and output.

1.4 CHARACTERISTIC FEATURES OF COMPUTERS

The following are the characteristics of a computer.

1.4.1 Accuracy:

Computers are very accurate. Computers perform millions of operations every second and can run errorless. This is because there is no human intervention between processing operations. If at all it shows wrong result/information, it will be due to errors in the supply of information by the user. Provisions have been made to check the message (data/information). Parity check code is introduced as in built to check the data. If the data received is correct, then only transmission of data takes place. Thus, the results produced by the computers are accurate.

1.4.2 Speed:

The speed of a computer means the number of operation a computer can perform in a second. It is to be noted that all computer operations are carried out by electrical

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pulses. The electrical pulses travel at a tremendous speed. The speed of computer may be expressed in terms of seconds or no of operations. Generally, the speed is expressed in terms of seconds or even milliseconds.

Millisecond - One thousand of a second
Microsecond - One millionth of a second
Nanosecond - Thousand millionth of a second
Picosecond - Million - millionth of a second

The speed of a computer is determined by clock rate. Clock rates are epressed in MHz (Million of cycles per second). Now Pentium II with clock rates of 266 MHz, 300 MHz, 333 MHz, 350MHz, and 400 MHz are largely available. In 1999, Pentium III with the clock rates of 450 MHz/500 Mhz has been introduced.

1.4.3 Storage :

Computer stores large amount of information/data. Each computer has its own internal memory in the CPU. The storage capacity of the memory unit is expressed in terms of kilobytes. The memory capacity of the computer can be increased through auxiliary or secondary storage devices. They are magnetic disks, CD-ROMs, magneto optical devices, fixed devices and solid state devices. Disks store data drives of 4GB, 9GB are the currently available with maximum sizes. A single CD-ROM can contain 600 MB of data. Complex softwares like MS-Office '97, Visual 'C' or Visual C++ require over 100 MB Storage. Therefore they are distributed as CD-ROMs. Floppy disks are available in 1.4 MB capacity. The information stored in these devices can be quickly read or retrieved whenever needed.

1.4.4 Versatility:

Computers can be used for any type of application. There is no limit for its application. It can be used to solve any type of problem. An each it is a versatile machine.

1.4.5 Automation:

Computers have long been used in data acquisition and data processing. Now, they are used in control systems also. Machine tools and industrial devices are controlled by computers. Air Traffic control systems use computers. The automatic industry has employed computers to test motors and other manufacturing operations. The industrial robot is an outcome of the computer technology. Computers are now extensively used in the quality control operations. In the present day, automated teller machines for disbursing cash against credit cards is a good example of computer automation. A new class of application known as office automation system is emerging very fast. This is due to the rapid developments in electronic communications system.

1.4.6 Diligence:

If a man starts working, he becomes tired after a few hours. But the computer works for hours together. In other words, the computer is a machine which does not get tired by doing continuous repetitive tasks. As it gives a series of continuous services, it improves the quality of service of an organisation and also the quality of human life.

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1.4.7 Reliability:

Since the results produced by the computers are accurate with high degree of precisions, they are reliable.

1.4.8. Capability:

If a computer is programmed once, then the program can be executed as many times as you need.

1.5 CLASSIFICATION OF COMPUTERS

Computer can be classified.

1.5.1. On the basis of generation

1.5.2. On the basis of purpose for which they are used

1.5.3. On the basis of construction

1.5.4 On the basis of memory capacity

1.5.1 Computers on the basis of generations:

Based on the technology, computers are accociated to various generations.

1.5.1.1 First Generation Computers (1946-1959)

Computers manufactured during this period, used vacuum tubes. The computers, fitted with vacuum tubes, are called first generation computers. ENIAC was of this category. This type of computers used 18000 vacuum tubes, weighed 30 tones and occupied a very large hall. The following are their characteristics:

- Large in size
- Slow operating speed
- Consumed high power
- More costlier
- Memory capacity=4096 words
- No provision to handle subprograms
- Unable to handle programming logic and non numeric problems
- Only 10 input, output instructions available
- Short life span.

Example of this category ENIAC, EDVAC, EDSAC, IBMMARK-I, UNIVAC, and so on.

1.5.1.2. Second Generation Computers (1960-1964)

The second generation computers used transistor in the place of vacuum tubes. The transistors was 1/10 the size of a valve. A transistor could do the same operation 1/10,00,000 of a second, which a first generation computer did in 1/3 of a second. During this period, certain high level languages such as BASIC, COBOL, FORTRAN, ALCOL were developed. For storing data and programs, magnetic disks were developed. It consumed little energy, and generated very less heat. It becames smaller, faster and had greater computing capability.

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During this period, system software like compliers, subroutine libraries and batch monitors emerged. The following are their special features:

- Less power consumption
- Less expensive
- High speed of operation
- Less heat

1.5.1.3. Third Generation Computers (1965-70):

The Computers, built during this period, used 'Integrated Circuits' (IC). An integrated circuit, in the form of chip, consists of more than 300 transistors. The use of IC's improved the auxiliary storage devices and input/output devices. These devices increased the data processing speed. Multi-processing and multi programming were made possible. The use of integrated circuits lead to drastic reduction in physical size and cost. Full pledged operating systems were introduced for automatic sharing of resources of the computers.

1.5.1.4 Fourth Generation Computers (1971 Onwards):

1972 is a remarkable year in the history of computer. Computers were made up of very large-scale integrated circuits (VLST). A large scale integrated circuit contains nearly 10000 transistors grouped in a single silicon chip known as Microprocessor. VLSI based computers are called Micro computers. A computer is called micro-computer for two reasons.

i) It contains a micro processor and

ii) It is small in size (ie.) miniature

Micro computers gave rise to a new class of general purpose machines called Personal Computers' (PC). A typical micro computer could be placed on a desk.

MS-DOS operating system of Microsoft Corporation was used as the control program, Now-a-days, MS-DOS is widely used in PCs. Amyriad applications software such as Wordstar, Dbase III plus, Lotus 1-2-3 and the like could be easily run on these machines. With powerful RAM capacity of 64 MB, Packages like ORACLE, SYBASE, POWERBUILDER, VISUAL BASIC and the like can be loaded and run. Multi-Media applications are special features of these powerful Micro-Computers.

In a further development, keyboard has been supplemented by the mouse, as an additional imput device. To add, CD-ROM (Compact Disk Drive) is another innovation during this period. The Pentium processor was introduced in 1993. Intel P1 processor was introduced in 1995, with 133 MHz. Pentium Pro at 200 MHz came into the market. Pentium II (Pentium Pro and Unix) with 233 MHz was introduced in 1998.

1.5.1.5 Fifth Generation Computers (Yet to come):

Upto fourth generation, computers have dealt with numbers and characters. Now efforts are being undertaken to make the computers store and process knowledge. These computers will think and take decisions and in certain cases better than human beings. These computers will be endowed with artificial intelligence. The main goal of AI is to replicate human processes using chips. In Japan, they have already started their project in

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1981. They call the machines as knowledge information processing systems (KIPS). KIPS will work as amplifier of human thought and intelligence. It is expected by all that the fifth generation computers will be commercially available in the 21st century.

1.5.2 Computers on the Basis of Construction

On the basis of construction and working, computers can be classified into:

i) Digital Computers

ii) Analog Computers

iii) Hybrid Computers

1.5.2.1 Digital Computers

A computer that operates by counting is called a digital computer. Digital computers operate on discrete quantities. Both numeric and non-numeric information are represented in the form of numerical digits. They use binary codes 0s and 1s to represent information. All operations are preformed on the basis of addition. These computers can be used in all fields.

1.5.2.2 Analog Computers:

A computer that operates by measuring is called analog computer. Analog computer measure continuously varying quantities like voltage and current. The problems are covered into equations and then to electrical signals. They give results in the form of graphs. They are useful for scientific purposes only. These computers cannot process alphanumeric information.

1.5.2.3 Hybrid Computers

The computers, which possess the features of both digital and analog are called Hybrid computers. In such computers, some calculations are done in the analog portion of the computer and some are done in the digital portion of the computer. In a hospital intensive care unit, in the digital portion, reports are prepared on the basis of data available in the analog portion.

Differences between a Digital Computer and an Analog Computer:

Digital Computer	Analog Computer
i) It Operates by counting	It operates by measuring
ii) It is concerned with discrete quantities.	It is concerned with continuous quantities.

iii) It does not require physical analogy of problems	It requires physical analogy of problems
iv) The calculations are first converted binary numbers	The calculations are converted into into equations and then into electrical signals
v) The output is in the form of discrete values.	The output is in the form of graph.
vi) More accurate	Less accurate.
vii) More memory is available.	Limited memory is available.
viii) High speed.	Less speed.
ix) Highly Flexible	Lacks flexibility.
x) Vast applications	Limited Applications.
xi) It can process alphanumeric information	It cannot process alphanumeric information

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CHECK YOUR PROGRESS

Fill in the blanks

1. The speed of the computer is measured in ________
2. The main component of the first generation computer is ________

Say True or False

3. Computers has its own memory memory in the CPU
4. The Storage capacity of the memory unit is expressed in terms of units.
5. Nano second is equal to
a One thousand of a second
b. one millionth of a second
c. Thousand millionth of a second
d. one second.

1.5.3 Computers out the basis of memory capacity

Computers can be classified into four types on the basis of memory capacity.

(i) Micro Computer

(ii) Mini Computer

(iii) Mainframe Computer

(iv) Super Computer

1.5.3.1 Micro Computer

A computer is called Micro Computer because of two reasons

(i) It is small in size and

(ii) It contains a micro processor.

In the micro computer, CPU is a microprocessor. A microprocessor is a processor all the components of which, are on a single integrated-circuit chip. Its storage capacity is low when compared to mini and main frame computers. The maximum word length (normally 16 bits) Varies according to the configuration of the computers. It accepts most of the high level languages. It is relatively less expensive.

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Micro-computers can be sub-divided into two types.

Home Computers:

Home computers are meant for entertainment, education and training. The keyboard of a home computer is integrated with CPU and the computer is interfaced with ordinary television. Vendors supply cassette tapes containing program for computer games and entertainment. Apart from this, several built in functions are available.

Personal Computers:

Since personal computers are designed for personal use of individuals/small business concerns, they are called so. They are meant for professionals, small business unit and office automation systems. They can be used for a variety of applications.

1.5.3.2. Mini Computers:

Third Generation Computers are minicomputers. Mini computers are multi-user systems. They have multi-terminal facilities. It has only one central processing unit but has many terminals and keyboards. It may be concurrently used by 20-40 users (The figure on the number should not be taken in a strict sense) at a time. The size of a mini computers is in between the size of a macro computer and main frame computer. It is more powerful than a microcomputer. The first mini-computers were employed for scientific applications. They play a major role in Computer Aided Manufacturing (CAM) and Computer Aided Designing (CAD). These computers are mainly used in banks and medium sized organization for data processing purposes.

1.5.3.3 Mainframe Computers:

Mainframe computers are physically larger than micros or minis. They have large primary storage capacity. A single machine can process several hundred different programs. More than hundred users can use a mainframe simultaneously. They are used for the scientific and engineering analysis, simulations of complex design projects, air craft designing etc. They are usually used by major corporations, government agencies, international banks, air lines, oil companies and national stock exchanges.

1.5.3.4 Super Computers :

Super computer is the most powerful of all computers as regards capacity, speed, accuracy etc. It can not be compared with any other computers. They can process hundreds of millions of instructions per second. The computing capability of a super computer is equal to that of 40000 micro computers. They are used for applications such as weather forecasting, nuclear science research, and aerodynamic modeling and powerful simulations in physics and university. The USA and Japan are the competitors in developing super computers. Cray Research (USA), Fujitsn (Japan) and Indian C-DAC (Centre for

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development of Advanced Computing , Pune are the manufacturers of super computers. The cost of super Computer is in the range of several crores of rupees. The Indian version PARAM was developed by C-DAC with the governmental subsidy.

PARAM 10000 has been installed, for the first time in the educational institution in India, at Amrita Institute of Advanced Computing, Coimbatore in 1999.

1.5.4 Classifications on the basis of purpose for which they are used:

Computer can be classified according to the purpose for which they are used.

i) General purpose computers and

ii) Special purpose computers

1.5.4.1 General Purpose Computer:

A digital computer is a general purpose computer. It is designed to perform a variety of tasks from simple arithmetic calculations to generation of charts. In other words, it can be used for both business applications and scientific applications. The computers you come across in offices and other places are general purpose computers.

1.5.4.2 Special Purpose Computer:

A special purpose computer is one, which is designed to perform a specific job. In such computers, all the instructions are in built. The given task is performed quickly and efficiently. It cannot be used for any other task. As such, it lacks versatility. For example, electronic volting machine, computer used for the reservations of tickets in the railway station etc.

The micrometers are built around micro processor chips. It is possible to pack a complete micro computer CPU on a single chip. However, several chips are usually used. One chip may be used to perform arithmetic logic and control functions. RAM chips handle primary memory storage function while micro computers are light enough to be moved easily. They can be used by one person at a time.

1.6 USES OF COMPUTERS IN THE MODERN SOCIETY

In modern days computer has various applications viz., scientific and business applications. Let us discuss some examples on business applications.

1.6.1 Payroll preparation:

To prepare the payroll of the employees, the following details are required. Employees names, Employees number, Basic pay, Allowances and Deductions. All the details are stored in the master file. The computer reads details from master file and

calculates net pay. The program also prints out pay slips for each employees. The payroll system also generates a number of statements.

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1.6.2 Inventory Control:

Inventory management and control is the main determining factor of profitability of the concern. The set of programs used to keep track of the purchase and issue of these inventories constitute the inventory control system. The inventory control system maintain a file known as inventory master. When an item is issued or received, the inventory update program updates the Inventory Master.

1.6.3 Sales Order Processing:

Real time system offer the possibility of a great prompt service to the customers. Their orders can be processed within virtually no time. Besides the following functions can be performance rapidly.

i) The inquiries about the customer's account status can be answered by the salesman.

ii) Credit appraisal can be carried out on-line.

iii) Sales analyse master file can be updated online.

iv) Inventory replenishment orders can be determined as a part of the sales order processing.

Check Your Progress
Fill in the blands
6. A computer that operates by measuring is ____________ computer
7. A digital computer is a ______________ purpose computer.
Say True or false
8. The output of a digital computer is in he form of graph
9. Super computer is the most powerful of all computers.
10. Super computer is the most powerful of all computers.
Choose the best
11. Computer has been applied for
a) Payroll preparation
b) Inventory control
c) Banking and Insurance

1.6.4 Banking:

Banks are the major users of computers. Opening of bank accounts, withdrawal of money, maintaining the accounts are done with the help of the computers. In advanced branches, payment are made automatically by the computer using Automatic Toller Machines " (ATM). Electronic Fund Transfer facilitates quick transfer of money from one place to another.

1.6.5 Insurance:

The Insurance industry uses computers to simplify the handling of administrative paper work. The computers produce a variety of external reports

1.6.6 Transportation:

Computers are used in the transport system for cost analysis, accounting, calculation of traffic rates, vehicle maintenance, reservation, etc. The railway and air reservation systems are based on online applications.

Computers are also used in other fields like Retail Stores, Government, Education, Public utilities, Distribution, Health Care, Printing and Entertainment.

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1.7 KEY TERMS

- Vaccum tube : A thermionic valve
- Tranister : A small semi conductor electronic device that is wed for amplification and switching purposes.
- Integrated Circuit : A complete miniature electronic circuit that is fabricated on a single chip of semi conductor, manufactured as a single unit.
- Digital : Pertaining to data that is in the form of digits.
- Analogue : Pertaining to data that consists of continuously variable Quantities.
- Hybrid - A mixed computer system in which analog and digital computing devices are combined.
- Binary - A numeral system with base 2.

1.8 SUMMARY

In this unit introduction about the computer has been discussed. Computer is an electronic device which accepts input data, manipulates them and produce desired result as output. Accuracy, speed, storage, versatility, automation, diligence, reliability and capability are the characteristics of the computers. Computers are classified on the basis of generation, purpose for which they are used, construction and its memory capacity. In modern days computers are used for various applications viz., payroll preparation, inventory control, sale order processing, banking, insurance and transportation. They are used in retail stores, government, education, public utilities, healthcare, printing and entertainment.

1.9 ANSWERS TO CHECK YOUR PROGRESS

1) Nano second	2) Vacuum tubes	3) T	4) F	5) C
6) Analog	7) General	8) False	9). True	10) D

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1-10 QUESTIONS/EXERCISES

Section – A

1. Explain the characteristics features of a computer.
2. Describe computers on the basis of memory capacity
3. Define computer. State its advantages and limitations.

Section – B

1. What is a Digital computer? How it differs from an Analog computer?
2. List out the different types of computers.
3. Explain characteristics and special features of the generation of computes.

1.11 FURTHER READING

1. Computer Applications in business – P. Parameswaran- S.Chand & Company Ltd., New Delhi -110 005.
2. Computer Applications in Business Management –Versha Metha and N.Kumar - Anmol Publications Pvt.Ltd., New Delhi – 110 002.

UNIT 2 COMPUTER SYSTEM

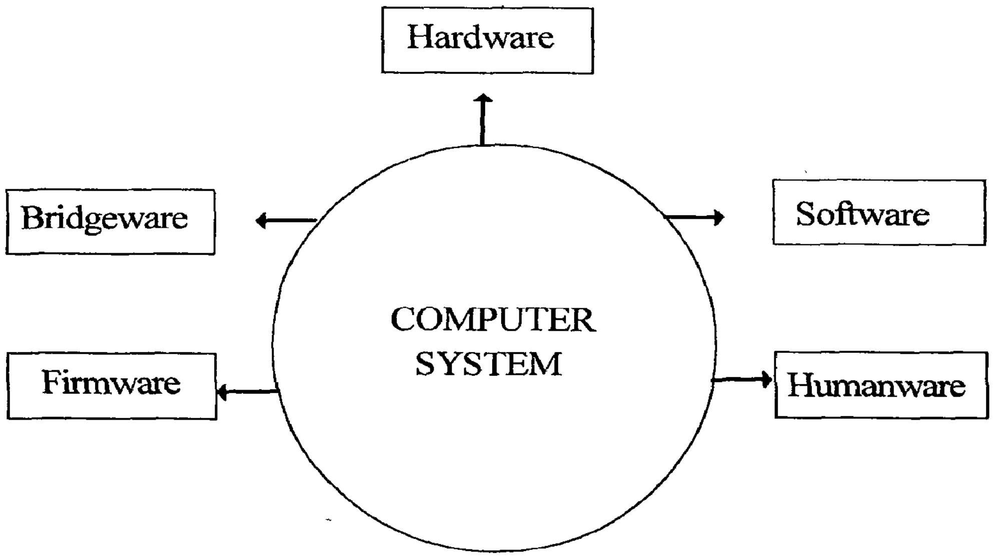
NOTES

Structure

2.1 Introduction
2.2 Unit Objectives
2.3 Elements of Computer System
2.4 Basic Principles of Operation of a Computer
2.5 Software
2.6 Hardware
2.7 Key Terms
2.8 Summary
2.9 Answers to Check Your Progress
2.10 Questions / Exercises
2.11 Further Reading

2.1 INTRODUCTION

You have studied meaning, classification and uses of computers in Unit No. 1. In this unit you are going to learn the computer system. A computer system is a combination of various components. It performs the system functions in input, processing, output, storage and control. Computer system includes Hardware, Software, Humanware, Firmware and Bridgeware. The following diagram explains the same.



2.2 UNIT OBJECTIVES

After going through this unit, you will be able to

- List the various elements of computer system
- Explain the principles of operation of a computer.
- Differentiate between software and hardware

2.3 ELEMENTS OF COMPUTER SYSTEM

A compute system is a combination of various components. Such as

i) Hardware

ii) Software

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iii) Humanware

iv) Firmware

v) Bridgeware

2.3.1 Hardware

The physical components of the computer such as input device, Central Processing Unit (CPU) and output device are known as Hardware.

2.3.2 Software

Software is the logical and sequential series of instructions, which are given to the computer system on the basis of which it works. In simple, software is a set of instructions (i.e. programs) given to the computer system to perform the desired task. There are two types of software:

1) System software

2) Application software

2.3.3 Humanware

People, who work on the computer, are collectively called Humanware. When computerisation begins, a team of people has to plan, design and implement the systems and operate the computers to effectively produce useful results. Throughout the above-mentioned processes, a number of computer professionals are needed.

System Manager

He is concerned with planning, monitoring and controlling of all activities related to computerisation.

System Analyst

He studied the problems to be solved in detail and prepares solution and program specifications.

Programmer

He prepares computer programs based on the specifications given by the system analyst.

Data Entry Operator

He operates the computer system for entering the data.

2.3.4 Firmware

The computer programs permanently stored in ROM (or) PROM are called Firmware. These programs are provided by computer manufacturing along with the computers. Generally these are booting programs which help in starting the computer. Such programs cannot be erased.

2.3.5 Bridgeware

The computer components and programs used to translate instruction and information written for one type of computer differ from those of other type of computer. To understand the components and programs, bridgeware is used. This is necessary when different computers are made by different manufactures.

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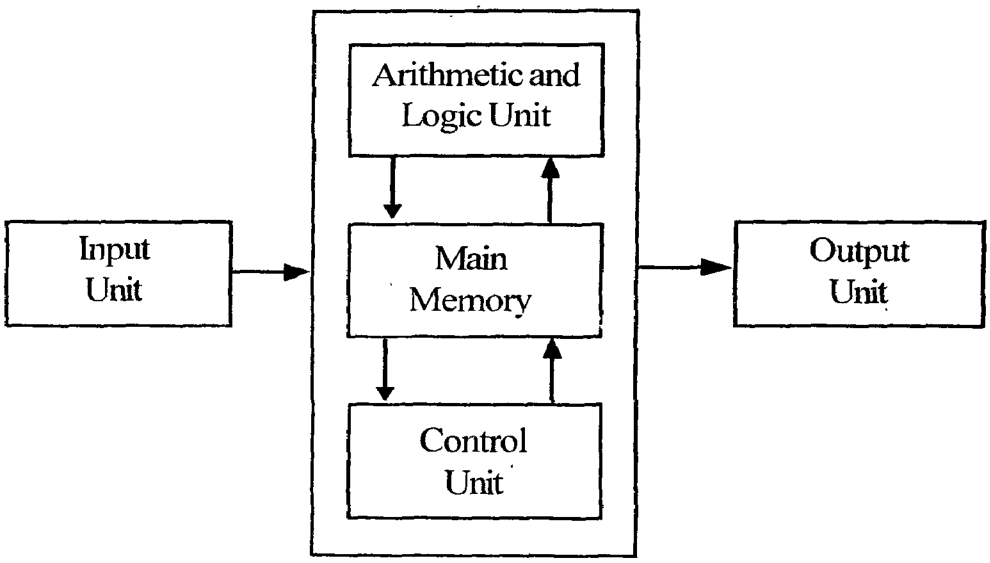
2.4 BASIC PRINCIPLE OF OPERATION OF A COMPUTER

Nowadays, most of the computers being used are digital computers. Though they may vary in constructional details, the basic principle of operation is almost the same. A computer is a collection of machines such as Central Processing Unit (CPU) and Peripherals (input and output devices). It performs the following functions.

i) Accepting inputs
ii) Memory manip.
iii) Arithmetic operations
iv) Decision making and
v) Giving output.

We can explain how these functions are performed by the computers with the help of a block diagram.



A computer has essentially three untis. They are
i) Input Unit
ii) Output Unit
iii) Central Processing Unit (Consisting of memory unit, control unit and arithmetic and logic unit).

2.4.1 Input Unit

Input device is a device through which data/programs are entered into the computer. It reads and accepts the data/programs and then it passes them to the memory unit of CPU. Some commonly used devices are:

i) Keyboard
ii) Mouse
iii) Joystick
iv) Magnetic Ink Character Reader (MICR)
v) Optical Character Reader (OCR)
vi) Bar Coding

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vii) Magnetic Disks
viii) Magnetic Tapes
ix) Floppy Disks
x) Hard Disks
xi) CD-ROM
xii) Optical Disks

2.4.2 Output Unit

After the data are processed, the output from such process may be required in two forms it may be in a form readable by the user in a printed form (or) if the information is required for subsequent processing. It may be necessary to store on storage devices. In certain cases, the user may require the output to be displayed on the screen. Therfore, on the basic of above requirements, output devices may be classified into three types.

i) Stored Output:
- Magnetic Tape
- Magnetic Disk (Floppy Disk or Hard Disk)

ii) Printed Output:
- Printers
- Plotters

iii) Displayed Output:
- Visual Display Unit (VDU).

2.3.4 Central Processing Unit (CPU)

The central processing unit is the nerve centre of the system. It not only performs the central control function but also it makes all the computational, logical and operational decisions. It contains Arithmetic and Logic Unit (ALU), control unit and main memory as its components. In other words, ALU, control unit and memory unit are together called the Central Processing Unit (CPU). The set of instructions and data are fed into the computer by means of an input device. The data and the instructions, thus received through key-board, are passed into the memory unit. The control unit directs and regulated the information and instructs the ALU to do the required calculations, by getting data from the memory unit. After processing, the results are stored in the memory unit. From the memory unit, the results are displayed by the output unit.

On the motherboard, there are some slots through which the various input and output devices are connected to the microprocessor and the memory chips. On the motherboard, the various components are connected to each other through sets of parallel electrical conducting lines called 'buses'. The microprocessor itself contains some special storage locations called 'registers'. Let us discuss the components of the CPU.

i) Arithmetic and Logic Unit

Functionally an ALU can be divided into two segments: the arithmetic unit and the logic unit. The arithmetic uni performs arithmetic operations such as addition, substraction, multiplication etc. The logic unit does logical comparisons such as Boolean AND, OR and

NOT. All the operations are carried out on the principle of addition. For example, division is done by repeated additions. In other words, division is nothing but repetitive complementary additions.

NOTES

They are three main components of the ALU: Mathematical gates, logic gates and registers. A gate is an electroic switch with several entrances but with only one exit. Data come in through the entrances and answers come out via the exit. A maths gate performs basic calculations. A logical gate performs logical operations. A register is a special storage area in the CPU to hold data during the completion of these operations.

Functions / Features of the ALU may be summarised as follows:

i) It always adds in order to perform the various arithmetic operations.

ii) All operations in the ALU are carried out in binary under the control of control unit. Once the processing is over, the final results are released to the output storage area from there, they proceed to the output service.

iii) ALU which is responsible for movemet of data between storage and itself, performs arithmetic and logical operations.

iv) The movement of data between the ALU and the CPU's storage area (ic register) may take place several times before one processing operation is completed.

ii) Control Unit

It controls, supervises and overseas all the activities of a computer and monitors the execution of any program processed. In other words, the control unit co-ordinates and controls the activities of the different components of the computer system. It's function are summarised as follows:

i) It co-ordinates the activities of the input-output, arithmetic and memory units by timing and directs the flow of information from one unit to another.

ii) It interprets each instruction and directs the other units to perform these instructions.

iii) It supervises input of information, storing and retrieving of information.

iv) It determines sequence of instructions to be executed.

v) It stores the results in the CPU memory.

vi) It repeats the cycle of operations till either it is instructed to stop (or) the last instruction is executed.

vii) It keeps a watch over the problems such as equipment malfunction, illogical instructions (or) erroreous data.

viii) In order to carryout the various functions (i.e. operations) mentioned above, the central unit has built certain basic registers: sequence control register, instruction register, decoder, address register, instruction address register.

iii) Memory Unit

All the instructions and data fed into the computer are stored in this unit. After performing certain calculations, the results are also stored in the memory. This is also known as primary storage area, input storage area and output storage area.

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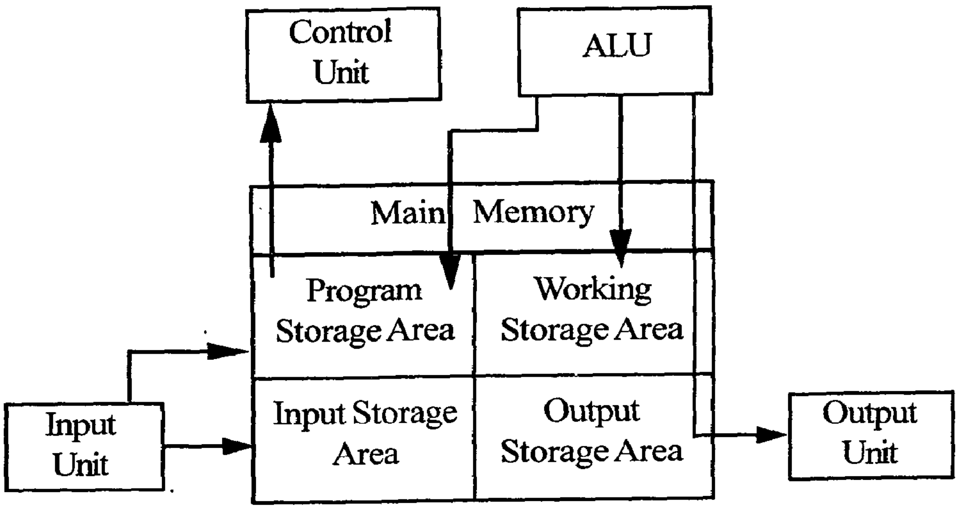

Program Storage Area	:	It holds the processing instructions.
Working Storage Area	:	It is scratch pad wherein intermediate data are held while being processed.
Input Storage Area	:	It is the place where data received form the computer are held until they are processed.
Output Storage Area	:	It holds the finished results until released to the users.

These four areas do not have any physical boundaries. And also they needed not exist in that order. They can vary from one application to another. The actual size of each area is determined by the programmer writing the application instructions.

Memory:

The Computer System requires a scratch pad for calculation and a storage area for keeping its results for further processing. This is called 'memory'. These are two types of memory.

i) Primary memory/Main memory/Internal memory

ii) Secondary memory/Auxillary memory/External memory.

Primary Memory / Main Memory:

Computers are so versatile in the sense that they can deal with a vast amount of data which remain in the memory. The terms memory and storage are used interchangeably in computeronics. The memory, which is built as a part of the CPU, is called 'main memory'. This is measured according to the amount of data which it can store at a given time. The storage capacity of the main memory is expressed in terms of bytes.

1 bit (i.e. Binary digit)	= Smallest unit of information represented by 0 or 1.
1 Byte	= 8 bits
1 Kilo Byte (i.e. KB)	= 1024 bytes
1 Mega Byte (MB)	= 1024 Kilo bytes
1 Giga Byte (GB)	= 1024 Mega byte
1 Tera Byte (TB)	= 1024 Giga bytes.

The Primary Storage is used for Four Purposes:

i) To hold data (in input storage area) until they are processed.

ii) To hold intermediate data until being processed (i.e. in working storage area)

iii) To hold the processing instructions (in program storage area)

iv) To hold the finished results of the processing operations (in output storage area).

Kinds of Memory

i) ROM (Read Only Memory)

ii) RAM (Random Access Memory)

i) ROM (Read Only Memory)

The main memory can be classified into two types:

i) Magnetic Core Memory and (ii) Semi Conductor Memory

Magnetic Core Memory was introduced in 1955 and was used till 1975. It is constructed with millions of basic elements known as 'ferrite Cores'. It provides a reliable and fast random access storage. Though it is expensive, it is extremely useful. Here it is described only for historical reasons. There is a tendency to call the main memory as magnetic core memory, event though it is a semi-conductor memory.

All modern computers use semi-conductor memory. Semi-conductor memory consists of electronic circuits prepared on silicon chips. The electronic circuit is called a flip flop. A flip-flop is also called a storage cell. Thousands of these storage cells can be prepared on a single silicon chip. Due to this, the size of memory is very small.

ii) RAM (Random Access Memory)

This is also a part of computer's memory. It stores all the data and the instructions and the results obtained from its calculation. This is a volatile storage which means that all the information will be lost when the computer is switched off. The Access time for getting information is faster one. This memory is otherwise called as temporary memory.

Different between RAM and ROM	
RAM	**ROM**
i) It is volatile in nature	It is non-volatile in nature
ii) Information can be stored and retrieved at the choice of the programmer.	Information stored in the memory cannot be altered (except in case of EPROM-Erasable Programmable Read Only Memory)
iii) It is used to store immediate results etc.	Permanent Function like Sin x, Cos x are stored.
iv) It is expensive	It is Cheap
v) It is easy to change	It is expensive to change.

2.5 SOFTWARE

Software is a very widely and loosely used term to refer to various packages. In essence, any program written in any language that will work on a particular computer system can be classified as software. Thus, the software is the logical and sequential

NOTES

CHECK YOUR PROGRESS

Fill in the blanks

1. The physical components of a computer are known as ________

2. People who work on the computer are called as ________

Say True or False

3. Software is a set of instructions.

4. Hard distk is an input unit.

Choose the best.

5. RAM is
   a. Volatile in nature
   b. non-volatile in nature
   c. permanent memory
   d. none of the above

NOTES

series of instructions, which are given to the computer system on the basis of which it works. In simple words, software is a set of instructions (programs) given to the computer system to perform the desired task. The computer cannot be to anything without software. It acts as an interface between the user and the computer.

2.5.1 Need for Software

In your day to day life, you have to maintain massive records for various purposes. For making decisions instantaneoulsy on the basis of information, you have to store data and information. With computer, we can make wonders in any field. You can store large amount of data and retrieve such data as and when you need for quick decision (or) for reference. Today computer has become a boon to the human society in all respects. For example, let us take the case of using computers in railway stations. The manual method of making reservation has now changed to computerised method. We can make advance reservations from any place for our onward and return journeys. The place at which reservation is made may differ from the place where we actually start our journey. It was not possible under manual method of reservations. In banks, trial balance, profit and loss account and balance sheet are prepared on daily basis with the help of computerised software. In short, software can be used in any area because of the following advantages.

i) As software are user friendly, we can work conveniently.
ii) Data can be fed into the computers on daily basis through online/off-line methods.
iii) Data can be retrieved in any combination at any point of time.
iv) Optimum utilisation of human resources can be made.

By usng computers, man power is considerably reduced. Such human resources can be utilised for some other jobs.

2.5.2 Types of Software

1) System Software
2) Application Software

1) System Software

System software is a set of instructions designed to operate and control the computer system. It is generally prepared by the manufacturers of computers. It can be further classified as follows:

i) Operating System
ii) Tranlators
iii) Utility programs

i) Operating System

Operating system software is a software which consists of programs that manage and control the over all operations of a computer. Computers cannot run without an operating system. It acts as an interface between the user and the computer. Whenever the computer is switched on, the operating system is first loaded. Then, only, we can operate the computer. It performs three functions.

NOTES

a) System Management

It manages the hardware, software and data resources of the computer system during the execution of application programs.

b) System Support

It supports the operations and management of a computer system by providing a variety of facilities.

c) System Development

It helps the users to develop system program. For example language translators, programming tools etc.

Since the operating system functions in the most efficient manner, it maximises the productivity of a computer system. At the same time, it minimises the amount of human interaction required during processing. It also helps to enter data, save and retrieve files, print (or) display output. Of all, it acts an interface between the user and the computer.

In simple terms, the OS performs the following functions:

i) To control input/output operations
ii) To take input from the keyboard
iii) To display message on the screen
iv) To store data on external storage device
v) To send output data to the printer
vi) To control the printer

There are three types of user interfaces

i) Command drives
ii) Menu drives
iii) Graphical User Interfaces (GUI)

Present day operating systems have moved towards the graphical user interfaces. A GUI presents icons, bars, buttons, boxes and other images.

The following are some of the popular operating systems

a) DOS
b) UNIX
c) Windows and
d) Network

a) DOS

The Disk Operating System (DOS) is the most popular operating system used in personal computers. If a computer has more than one user terminal, DOS cannot be used. In computer terms, we say that DOS is not a multiuser.

In personal computers, MS-DOS (Microsoft Operating Systems) and OS/2 (Operating System-2) are generally used.

b) UNIX

Unix is the most popular multi user operating system. In the computers that have more than one user terminal, UNIX can be used.

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c) Windows

Software, almost all the softwares are now developed on windows based manner. In this method, the user has a little work on the keyboard. The monitor shows everything in the form of pictures and one can easily choose from the options given. A hardware called mouse is used to operate the computer. The latest version of windows is WINDOWS NT and it has been developed by the microsoft company. It is far superior to UNIX, WINDOWS 95 and it is an advanced OS processing.

Special features of the GUI, Multitasking, Networking, Multimedia and Several other capabilities are contained in the windows based OS.

WINDOWS NT (New Technology was introduced in 1993. It is a powerful multitasking. It is a multiuser OS installed in the Network server to manage LANs and Workstations.

d) Network

In recent developments, many computers can be linked together with a master computer (i.e. file server). Data and programs can be transferred from one computer to another. For example, the computers in the various departments of the company can be linked to the head office. This type of connection is called Network. When the computers are connected with the file server using a netwrok, they need an operating system to handle the network ~~facility~~.

ii) Translators

Computers knows only machine language i.e., binary codes such as 0 and 1. Therefore, any instructions to the computer must be expressed in machine language. It is very difficult to write instructions in machine language. We write instructions in high level language (which is similar to English statements). Therefore, instructions in high level language have to be translated into machine language codes.

Translators are of three types:

i) Assemblers
ii) Compilers
iii) Interpreters

Softwares developed for this purpose are categorised as system software.

iii) Utility Programs

Utility programs are system programs which provide facilities for performing some common tasks of a routine nature. They are:

* Sort utilities
* Editors
* File copying
* File Maintenance
* Debuggng
* System status utilities

2. Application Software

Application Software is a software which is written for a specific application. In other words, it is a set of programs meant for a specific application. For example, programs for the preparation of Pay roll, programs for inventory control etc. are some of the application software. Application packages such as dbase, wordstar, lotus 1-2-3, clipper etc, can also be terms as application softwares. The following are various application areas of softwares.

Accounting	:	Cashbook, bankbook, vouchers, debit and credit notes, ledger posting, trial balances and balance sheet.
Inventory	:	Information details on stock in and stock out, ordering level, recording level, other control methods, stock location etc.
Sales System	:	Price Information, quotation, billing, receipts, cheque transactions etc.
Purchases	:	All purchase activities, suppliers list etc.
Library System	:	Books purchased, books issued, books returned, accession register, missing list etc.
Banking	:	Inter-branch transactions, interbank exchange system, ATM, ALPM etc.
Transport	:	Railways, airlines, ticketing system etc.

2.6 HARDWARE

The electronic circuits and mechanical components of a computer such as motherboard, hard disk, printers, central processing unit, keyboard, mouse and other peripheral devices, which are tangible in nature, or which can be felt, touched are known as hardware.

Difference between Hardware and Software :

	Hardware	Software
i)	It is the physical components of the computer	It is a set of instructions to bring the hardware system into operation.
ii)	The Design can be modified according to.the capacity.	This should be prepared according to the type of the capacity.
iii)	It understands only machine language (or) Low Level Language	It is written in high level language.
iv)	It works with binary codes i.e. 0s and 1s.	It is represented by the high level language
v)	It consists of input unit, output unit and CPU.	It is categorised as operating system, utility programs, processors application programs etc.

NOTES

CHECK YOUR PROGRESS

Fill in the blanks

1 System software is to operate and control the ____________

2. Software is written in ____________ level language.

Say True or false

3. Unix is an operating system

4. Mouse is a software

Choose the best.

Transaltor refers to

a. Assembler

b. Complier

c. Interpreter

d. all the above.

NOTES

2.7 KEY TERMS

- ROM - Read only method
- RAM - Random Access Memory
- System Software - The software which controls the computer and runs applications.
- Application software - Software that is designed for the solution of an application problem.
- Window - A rectangular area of the display screen with visible boudnaries within which data is displayed.
- Network - A series of inter connected computer terminals providing a data communication service.
- Assembler - A programme that can accept an assembly language programme at its input and translate it into machine code as its output.
- Compiler - A programme that translate a source programe into an executale programme.
- Interpreter - A programme that analyse each line of a high level language programme and then excecutes it immediately.
- Utility programme - A programme that provides a useful function.

2.8 SUMMARY

A computer is a combination of various components such as Hardware, Software, Humanware, Firmware and Bridgeware. Computer performs through three essential units known as Input unit, Output unit and Central Processing Unit. Mouse, Floppy disks, Hard disks. Key board are some of the important input devices. The output is displayed either on the screen or in a printed form. The Central Processing Unit which is the nerve centre of the system consists of arithmetic and logic unit, control unit and memory unit. There are two types of memory viz., primary and secondary. They are also known as main and auxilillary memories. Software is a set of instructions given to the comptuer system to perform the desired taks. System software and application software are the two of its types. Software can be classified as operating system, translators and utility programs. Application softwares are written for specific applications. Hardware refers to all the physical components of a computer.

2.9 ANSWERS TO CHECK YOUR PROGRESS

1. Hardware	2. Humanware	3. T	4. T	5. (a)
6. Computer	7. High	8. T	9. F	10.(d)

2.10 QUESTIONS / EXERCISES

Section A

1. Define operating system. Explain its various functions.
2. Explain any four operating systems
3. Compare RAM and ROM

4. What do you understand by primary storage and secondary storage
5. Distinguish between Hardware and Software.

Secton B

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6. What are the elements of computer system?
7. Explain how a computer functions with the help of a block diagram.
8. Explain the different types of software.

2.11 FURTHER READING

Fundamental of Computers - V. Rajaram - PHI
Learning Private Limited, New Delhi - 110001.

NOTES

UNIT 3 MANAGEMENT INFORMATION SYSTEM (MIS)

Structure

3.1 Introduction
3.2 Unit Objectives
3.3 Meaning and Definition of MIS
3.4 Elements of MIS
3.5 Characteristics of MIS
3.6 Functions of MIS
3.7 Establishment of MIS
3.8 Key Terms
3.9 Summary
3.10 Answers to Check Your Progress
3.11 Questions / Exercises
3.12 Further Reading

3.1 INTRODUCTION

Information is the life-blood of an organisation particularly in the case of system approach management. A modern organisation demands new dimensions in modern management due to accelerating complexities. As such nowadays, a modern organisation requires a system to provide information to managers at all levels at a right time and in right form to make decisions MIS (Management Information System) is an organised method of providing past-present and projection information relating to internal operations and external intelligence. It supports planning, control and operational functions of an organisation by furnishing uniform information in proper time frame to assist the decision making process.

3.2 UNIT OBJECTIVES

After going through this unit, you will be able to:

- explain the meaning of MIS
- list of elements of MIS
- list of characterists of MIS
- explain the functions
- able to establish MIS in an organisation.

3.3 MEANING AND DEFINITION OF MIS

3.3.1 What is Management?

Management has been defined in a variety of ways but for our purpose it comprises the processes or activities that describe what managers do in the operation of their organisation plan, organize, initiate and control operations. They plan by setting

strategies and goals and selecting the best course of action to achieve the plan. They organize the tasks necessary for the operational plan, set these tasks up into homogeneous groups and assign authority delegation. They control the performance of the work by setting performance and standards and avoiding deviation from standard.

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3.3.2 What is Information?

Data must be distinguished from information, and the distinction is clear and important for our purposes. Data are facts and figures that are not currently being used in a decision process and usually taken from the historical records that we recorded and field without imediate intent to retrieve for decision making. An example would be any one of the supporting documents, ledgers and so on that comprise the source material for profit and loss statements. Such material would only be of historical interest to an external auditor.

Information consists of data that have been retrieved, processed, or otherwise used for informative or infereence purposes or as a basis for forecasting or for decision making.

3.3.3 What is System?

A system can be described simply as a set of elements joined together for a common objective. A subsystem is part of a larger system with which you are concerned. All systems are parts of larger systems. For our purpose, the organization is the system and the parts (divisions, departments, functions, unit etc.) are the subsystems.

3.3.4 MIS-Definition:

MIS is defined as the combination of men, machine and procedures for collecting pertinent information from the internal and external sources of a firm and processing these information for the purpose of facilitating the process of decision making.

MIS is also defined as an integrated user-machine system for providing information to support operations, management and decision-making function in an organisation. The system utilises computer hardware and software, manual procedure and models for analysis. Information is viewed as a resource much like land, labour and capital. It is not a free good. It must be obtained, processed, stored, retrieved, manipulated and analysed, distributed etc. An organisation with a well-defined information system will generally have a competitive advantage over organisation with poor systems.

3.4 ELEMENTS OF MIS

The MIS can be sub-divided into four categories, each type of system is designed to a specific requirements.

Management Information System

- TPS Transaction Processing System
- IPS Information Providing System
- DSS Decision Support System
- PDS Programmed Decision Making System

i) Transation Processing System:

These systems are designed for processing day to day transactions occuring in the organization. These systems involves large volume of data and mainly help in the operation control area of the company.

ii) Information Providing System:

Attempt is made here to generate information to help decision making activity. Starting with transaction processing system, summary and exception reports are produced. Summary reports are tabulation of details by categories. Exception reports provide information about deviations of actuals from planned and indicate the reasons of deviations.

iii) Decision Support System:

This system is for improving the analytical capability of the decision maker. Attempt is made here to create an interactive model of a real life situation, so that the decision maker can interrogate the system for generation and evaluation of various alternatives.

iv) Programmed Decision Making System:

This involves creating systems for programmed decision areas, so that a decision is made by the system instead of a person. This requires very clear specifications of the procedure used.

3.5 CHARACTERISTICS OF MIS

The following are the characteristics of MIS

i) MIS is management oriented:

The Designing of MIS takes care of the managers, who meet the information requirement. The development of the system starts after deciding the management needs and keeping in view of the overall objectives of the management.

ii) Management directed:

Since MIS requires heavy planning and investment, management is deeply involved in the design, implementation and maintenance of the system.

iii) Integrated System:

Five Ms-Men, Money, Materials, Machines and Methods are the basic resources of management information and is recognized as an important factor and its effective use

contributes to the success of the management. MIS is the catalyst and nerve centre of an organisation. It has a number of subsystems. In order to make these subsystems effective, it becomes necessary that they have to be viewed as an integrated system, so that the result is balanced. It binds together databases of all subsystems of the business system and through information interchange, integrates the organisation.

NOTES

iv) Avoids Redundancy in Data Storage:

Since MIS is an integrated system it avoids unnecessary duplication and redundancy in data gathering and storage.

v) Common Data Flow:

To achieve the objective of integration and to avoid duplication and redundancy in data gathering, storage and retrieval, data capturing is usually confined to original sources and it is done only once. Common data flow tries to utilize minimum data processing effort and strives to minimize the number of output documents and reports. This type of integration can avoid duplication, simplify operation and produce an effective MIS. But separate files should be opened which are significant to one applciation with the use of common data flow.

Check your progress
Fill in the blanks
1. Information is the __________ of an organisation.
2. MIS can be subdivided into _______ categories.
3. MIS is __________ oriented.
Say True or False
4. The processed data is known as information.
5. A system is a single element for a common objective.

vi) Heavy Planning Element:

Design and implementation of MIS requires detailed and meticulous planning of such activiites as acquisition and deployment of hardware, software humanware data processing operations, information presentation and feedback.

vii) Subsystem Concept:

MIS gives provision for breaking into various subsystems based on the activity as well as the functions of the organisation, so that effective implementation of each subsystem is possible at a time.

viii) Common Database:

It acts as a master that holds the functional subsystems together. It achieves this aim by allowing access to different master files of data to several functional subsystms. Data requirements for different levels of management also supports the need of more than one database, unique databases and common database.

ix) Flexibiilty and Ease of Use:

MIS has been designed flexible enough to accommodate new requirments. The system is easy to operate so that not much computer skills are required on the part of the user to access database for information or for carrying out special analysis of data.

x) Computerisation:

MIS can be computerised because of its nature as a comprehensive system. This provides speed in creatng and accessing files, accuracy, consistency in data processing, reduction in clerical work, avoid human errors etc.

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3.6 FUNCTIONS OF AN MIS

Managment Information system is a combination of computers and procedures for providing information that managers use in making decisions.

Collect Data

Massive amount of information are available to organisations - personnel records, information about customers, information abuot competitors, sales data, accounting data and so on. The first function of an MIS is to determine the information needed to make decisions and to organise it into a database.

A 'DataBase' is an integrated collection of data stored in one place for efficient access and information processing.

Data can be obtained from sources, within and outside the organisation. Generally, most data collected for an MIS came from internal sources such as company records or reports and information compiled by managers themselves. External sources include trade publication, customers and consultants.

Store and Process Data:

After creation of data, a database must be stored and processed in a form useful to managers. Data are generally stored on magnetic tape or hard disks when mainframe computers are used and on hard disks or floppy (soft) disks, when minicomputers are used. The data can be loaded into computers for easyaccess by the user.

Present Information to Managers:

After collection of data, storing and processing of data, the next step is to present the information to managers for their use.

3.7 ESTABLISHMENT OF MIS (PLANNING AND DESIGNING)

The process of establshing an MIS involves four stages.

3.7.1 Planning for the MIS

3.7.2 Designing the MIS

3.7.3 Implementing the MIS

3.7.4 Improving the MIS

3.7.1 Planning for the MIS:

This is an important stages and is critical for MIS success. Comonly cited factors that make planning for the establishment of an MIS are:

i) Typically long periods of time to acquire MIS related data processing equipment.

ii) To integrate it within the operation of the organisation.

iii) The difficulty of hiring competent operators of the equipment

iv) The major amount of financial and managerial resources needed to operate the MIS.

An MIS plan is to be worked out and it differes from organisation to organisation. A checklist of major topics are as shown below:

i) Hardware projection (derived from projects)

ii) Human resources projection (derived from projects)

iii) Financial projects by time period.

Further details for each of the above need to be worked out.

This particular plan specifies that if management decides there is not sufficient potential benefit to be gained by establishing the MIS, given its total costs, the projects should be terminated.

3.7.2 Designing the MIS

Designing the MIS involes strategic decision making. The designing of an MIS should begin with an analysis of the types of decsiions, the managers actually make in a particular organisation. MIS should consist of four steps.

i) Defining various decisions that must be made to run an organisation.

ii) Determining the types of management policies that may influence the ways in which these decisions should be made.

iii) Pinpointing the types of data needed to make these decisions.

iv) Establishing a mechanism for gathering and appropriately processing the data to obtain needed information.

For the purpose of evolving a design of the MIS, a number of design inputs considered essential. Some of the more important design inputs are:

i) Results of:

Enterprise wide information requirement analysis

Information interface requirement analysis

SWOT analysis

System audits

Benchmarking exercises

Forecast exercise

ii) Master Plan of Long-term information systems.

iii) Status reports on existing modules and systems.

iv) Corporate goals are reflected through MIS goals and objectives.

v) Corporate policy guidelines for implementation of MIS.

vi) Review of existing resources and their utilization.

NOTES

The design of MIS various from organisation to organisation. It would be very difficult to generalize the design considerations that could be made applicable as empirical design considerations. But, it is only possible to provide general guidelines which would be applied to most of the designs. The general guidelines are:

i) Individual modules should have a specified degree of fredom linked with certain level of data discipline to ensure integration with other modules. It should be possible to commence implementation of individual module or a group of modules without waitng for completion of other modules in the MIS.

ii) MIS design should provide for hierarchical control over individual modules and for coordination of interfaces.

iii) Interfaces between different moduels should be clearly mapped in terms of content, frequency and mode of operation.

iv) The design output should conform to the design input requirements.

v) The design is consistent with the existing tools of information technology.

CHECK YOUR PROGRESS
Fill in the blanks
6.The design of MIS varies from ______ to organisation.
7.Once the MIS is operating, MIS managers should continuously strive to______ the value.
Say True or False
8. Planning is not important for MIS success.
9. Designing of MIS involves strategic decision making
10. The design output should confirm to the design input requirements.

3.7.3 Implementing the MIS

The third stage in the process of establishing an MIS within an organisation is implementation - that is, putting the planned and designed MIS into operation or action. In this stage, the equipment is acquired and integrated into the organisation designated data are gathered, analysed as planned, and distributed to appropriate managers within the organisation. And line managers make decisions based on the information they receive from the MIS. Implementing the MIS is explained.

3.7.4 Improving the MIS

Once the MIS is operating, MIS managers should continiously strive to maximise its value.

3.8 KEY TERMS

•Management	-	Top level people in an organisation who plan, organise and control operations to achieve the goal.
•Information	-	Processed data for decision making.
•System	-	Set of elements for a common objective.
•Planning	-	Process of deciding what to be done in the organisation.
•Designing	-	Strategic decision making
•Implementing	-	Putting the plan and design into operation.

3.9 SUMMARY

A modern organisation require a system to provide information to managers at all levels to make decisions. Management control the performance of the work by setting standards and avoiding deviation from standard. Information consists of data that have been processed. Management informat system is an integrated use-machine system for

providng information to support management in decision making. MIS can be sub-divided into Transaction Processing System, Information Providing System, Decision Support System and Programmed Decision Making System. Planning, Designing, Implementing and Improving are the four stages of establishing the Management Information System.

3.10 ANSWERS TO CHECK YOUR PROGRESS

1. Life-blood	2. Four	3. Management	4. T	5. F
6. Organisation	7. Maximise	8. False	9. T	10.T

3.11 QUESTIONS / EXERCISES

Section A

1. Discuss the characteristics of MIS
2. Define MIS. What are its elements?

Section B

3. How will you design MIS in an organisation? Explain
4. Explain the elements and functions of MIS in detail.

3.12 FURTHER READING

1. Management Information System - R.C. Gupta - Tata McGraw Hall Publishing Company Limited, New Delhi.

2. Management Information System - James Breen - Galgotia Publications, New Delhi.

UNIT 4 DATA PROCESSING

NOTES

Structure

4.1 Introduction
4.2 Unit Objectives
4.3 Data Vs Information
4.4 Stages in Data Processing
4.5 Objectives of Data Processing
4.6 Techniques of Data Processing
4.7 Methods of Data Processing
4.8 Data Processing Applications in Business
4.9 Key Terms
4.10 Summary
4.11 Answers to Check Your Progress
4.12 Questions / Exercises

4.1 INTRODUCTION

Data is the plural of the word datum, which means any collection of facts. Data can be considered as the raw material of information. The data may be numerical such as sales report or non-numerical such as employee's name. Once the data are converted into meaningful information, they can be called as information. Conversion of data into meaningful information is called data processing.

Data processing is viewed as a system that accepts data as input, processes it into information as output. The following diagram give a detailed version of data processing cycle.

4.2 UNIT OBJECTIVES

After going through this unit, you will be able to:

- Differentiate between data and information
- Explain the stages in data processing
- List the objectives of data processing
- Explain the Techniques of data processing
- List the method of data processing
- Explain how to apply the data processing in business

NOTES

4.3 DATA VS INFORMATION

	Data	Information
(i)	Data are raw facts	Informations are finished form of data.
(ii)	Data are unstructured in nature	Informations are structured in nature.
(iii)	Unprocessed representation is 'data'	Processed repersentation is information
(iv)	This is the basis from which information is derived.	This is the basis from which decision is taken.

Information is generated from the data items after performing a set of processes/ operations. Performing these processes in a specific sequence is known as data processing.

Data processing is a series of actions (or) operations that convert data into useful information. Therefore, conversion of data into information is called data procesing. Data processing is mainly associated with business and commercial activities, as they involve large amount of data.

4.4 STAGES INVOLVED IN DATA PROCESSING

Data processing is the restriction, manipulating (or) recording of data to attach value and to increase their usefulness for some specific purpose.

4.4.1 Determining data to be Processed :

The first step involved in data processing is to determine what data are required to generate the required information. Such data are to be taken from source documents (source documents are those documents which contain basic data regarding particular aspect of organnisation). This step assumes significance in the sense that the collection of data should be in tune with the objectives of the system. In other words, this step refers to collection of necessary data to obtain desired result.

4.4.2 Input of Data:

After the collection of necessary data from the source document, the data should be inputted into the data processing system. Before that, they would be taken to make the data acceptable to the data processing system (For example: Computer). Sometimes it may become necessary to code the data for quick reference. If data are coded, only codes are to be entered into the designate forms.

4.4.3 Manipulation:

It involves the process of classifying the data, sorting the data and summarising the data.

a) Classifying the Data: Classification of data means orgainsing data into related groups according to one (or) more characteristics. For example: Employees may be grouped on the basis of designation etc.

b) Sorting: After data are classified, it is necessary to arrange (or) rearrange the data into some logical order, so that processing can be carried out conveniently. For example:

NOTES

employee records may be arranged/rearranged in the ascending order/descending order alphabetically. This arranging (or) rearranging is called 'sorting': It ensures identification of data, without loss of time.

c) Verification of Data: Data are to be verified to ensure accuracy before proceeding for processing them.

d) Comparing the Data: One set of data may be compared with another set of data for subsequent action.

e) Calculation: To create meaningful results, arithmetical calculation has to be performed.

For Example: Calculation of net pay of the employees.

f) Summarising: Data to be of value must be reduced to a meaningful form. This process is called 'Summarising'. For example: How many students have passed and how many students have got first class, second class and so on.

4.4.4 Output:

After the data have been manipulated, the results have to be delivered/communicated to the concerned. The distribution of processed data may be in the form of reports, tables (or) a document.

4.4.5 Storage:

Finally the results i.e. Processed data must be retained for future reference. Whenever need arises they can be retrieved.

The data processing activities can be summarized in the form of chart as follows:

Date Input	Processing	Information
(i) Determination of input data from source documents	Classification of data	Formal presentation of output ie results
(ii) Making data in acceptable from	Sorting of data	Analysis of data
(iii) Feeding data	Verfication of data	Storage of output
(iv)	Arithmetical Manipulation	
(v)	Summarising of data	

4.5 OBJECTIVES OF DATA PROCESSING

The following are the general objectives of data processing.

i) To handle large volume of data

ii) To provide qualitative and quantitative information.

iii) To provide appropriate and timely information.

iv) To store information and retrieve them as and when necessary.

v) To maintain the performance of organisation at optimum level.

4.6 TECHNIQUES OF DATA PROCESSING

These are three techniques available for processing.

i) Manual Data Processing

ii) Mechanical Data Processing and

iii) Electronic Data Processing.

NOTES

4.6.1 Manual Data Processing

When processing of data is done by the people, it is known as manual data processing. It is still in use in most of the concerns. In this system, the human being collects data, manipulates them and makes output by himself. This method is applicable when the amount of data to be processed is small. However, it suffers from certain disadvantages such as time consuming process, inaccurate to certain extent, delay etc.

4.6.2 Mechanical Data Processing

In mechanical data processing, various machines are used to perform processing operations such as arithmetic calculations, sorting and summarising of data (electro) mechanical devices such as calculators, tabulators, are used. It goes with certain advantages such as speed, accuracy, neatness etc.

4.6.3 Electronic Data Processing (EDP)

It involves the use of computers. The computers have become a powerful tool for data processing because of its capability to store large amount of data, the speed with which it performs and of its capacity to produce results with high degree of accuracy. Electronic Data Processing implies data processing by computer.

4.7 METHODS OF DATA PROCESSING

Computer system process the data with speed, accuracy and efficiency. However, its efficiency depends mainly on the way the computer system is utilized. Central Processing Unit (CPU) of the computer performs millions of instruction per second, depicting its speed human beings cannot interact with the computers at such speed. Even though the human beings feed the data at high typing speed, the CPU has to wait a lot for the data input thus wasting its time which would be better utilized for processing. Another reasons that Input / Output devices are basically mechanical devices. They are slow in data transfer, thus again wasting the time of CPU. To overcome these two restraints, many innovations have been made both in hardware and software so that many users can use the computer simultaneously, using the CPU time properly and profitably.

With the aim to achieve optional efficiency, the following different methods have been used for data processing.

i) Batch Processing

ii) On-Line Processing

iii) Real Time Processing

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iv) Time Sharing

v) Multi Programming

vi) Multi-Processing

vii) Multitasking

viii) Distributed Processing

ix) Spooling

4.8 DATA PROCESSING APPLICATIONS IN BUSINESS

The following are some data processing applications undertaken by the commercial organisation.

1. Process Control

In the production process, a computer is directly connected to some plant to control and monitor it. Here, the computer receives the data directly from the plant. It analyse the input data and initiates action to control the on-going process.

2. Accounting

The Data processing system can be used to maintain the accounting records and in the preparation of final accounts. The general ledger, Accounts Payable, Accounts Receivable, etc are the examples for the computerised accounting system followed in most business organisations.

3. Payroll preparation

In personnel department the data processing system is used to record the operations of the number of employees of different departments in each shifts, leave taken, deductions such as ESI, PF and finally in the preparation of pay slips.

4. Sales Analysis

The Data processing system is highly useful in sales analysis. The sales manager can prepare the sales forecast on the basis of past month's sales reports and subsequent future actions can be taken.

5. Inventory Management

Actually the Data Processing system is a boon to every organisation, in respect of inventory management. Data processing is used to maintain upto date information about stock, their costs and to initiate orders when the times are about to be exhausted.

6. Office Automation

The modern offices and business organisations are dependent upon computer based office automation for their competitiveness and better management.

7. Banking and Insurance

Data processing systems are highly needed in banking sector where the customer satisfaction is the main criterion. To provide quick and perfect service, data processing

system is used. Automatic Teller Machines are placed in big cities and linked to central computers. Hence, the delay in processing is completely avoided.

8. Insurance and Stock Broking

NOTES

Insurance companies and stock broking firms also use the computerised data processing systems. Large volume of data have to be processed for the preparation of policy statements, interest calculations, renewal notices and in dealing with the securities.

9. Managerial Aid

The Data Processing system is used as a managerial aid in decision making by solving business problems. It is also very useful in the areas of linear programming, PERT, CPM etc.

4.9 KEY TERMS

- •Data - Numbers, Words, Characters that are entered into a computer system to be stored and processed for some purpose.
- •Information - Processed data.
- •Manipulation - Changing data to some useful form.
- •Sorting - The process of arranging a set of items into a specified order.

4.10 SUMMARY

Data Processing is a system that accepts data as input, process it into information as output. Data refer to any collection of facts. Data may be numerical or non-numericals. When data are processed, they are converted into meaningful information. The objective of data processing is mainly to handle large volume of data in such a way to provide appropriate and timely information. Data are processed by following manual, mechanical and electronic techniques. On-line processing, time sharing, multi-processing, distributed processing, real time processing are some of the important methods of data processing. Commercial organisations apply data processing in accounting, pay roll, sales analysis, inventory management, banking, insurance, stock broking and also as managerial aid in taking decisions.

4.11 ANSWERS TO CHECK YOUR PROGRESS

1. datum	2. related /similar	3. T	4. T	5.d
6. small	7. Decision	8. T	9. T	5. F

4.12 QUESTIONS / EXERCISES

Section A

1. Define data processing. How does the term 'Data' differ from information?
2. What are the steps involved in data processing?
3. What are the objectives of data processing?

Section B

4. What are the different methods of data processing?
5. What are business applications of data processing?

NOTES

UNIT 5 BASIC LANGUAGE

Structure

5.1 Introduction
5.2 Unit Objectives
5.3 Elements of Basic
5.4 Hierarchy of Operation
5.5 Structure of a Basic Program
5.6 Basic Programming Statement
5.7 Looping
5.8 Key Terms
5.9 Summary
5.10 Answers to Check Your Progress
5.11 Questions / Exercises
5.12 Further Reading

5.1 INTRODUCTION

The computer being an electronic machine, understands only the electrical circuitary. The operations of the computer are controlled by instructions. The language used for issuing instructions is called as programming language. The user has to learn the programming language to communicate with the computer. Machine language, assembly language and high level language are the three languages used to write the programs. Machine language is difficult to learn and time consuming to write. Assembly language is machine dependent and knowledge of hardward is required. To overcome these difficulties several high level languages were developed. The high level language does not require the programmer to have a detailed knowledge of hardware of the computer. The high level language contain statements that have much lite English and Maths. BASIC, PASCAL, FORTRAN, COBOL are examples of high level language.

Basic is a user friendly language. Basic stands for "Beginners all purpose symbolic instruction code". It was developed by Prof.John Kemeny and Thomas Kurtz in the year 1964 at Dartmouth College, New Hampshire, U.S.A., Since then, basic has undergone many modifications and improvement. At present many versions of basic are available.

5.2 UNIT OBJECTIVES

After going through this unit, you will be able to:

- List the elements of basic
- Explain the structure of basic program
- List and explain the programming statements
- Apply the loops in writing the programs.

5.3 ELEMENTS OF BASIC

NOTES

Basic language is easy to learn and suitable for conversational programming. It is suitable for both scientific and business applications. The following are the important elements of basic language.

5.3.1 Character set

5.3.2 Variables

5.3.3 Constants

5.3.4 Operators

5.3.5 Expressions

5.3.6 Statements

5.3.1 Character set

When you speak or write any language you first learn its alphabets. Similarly when you want to use any programming language you must learn its character set. It includes the following.

i) Alphabets ——————— A to Z = 26

ii) Numerical ——————— 0 to 9 = 10

iii) Special characters
+, -, *, /
^, =, <, >
. , ; :
( ) " $
} = 16

Besides the above, the following are also used lb, # and? Letters are used only in capital (upper case) form. Using these characters you can form the statements in basic.

5.3.2 Variable

A quantity whose value changes during execution of a program is called variable. Here value means either numeric value (or) string value. Each such value has a specific storage location in the memory of the computer system where it is stored along with the name of the variable (given by the programmer). Variable can also called as datanames (or) identifiers (or) User defined names (or) programmer supplied names.

Types of variables are as follows:

1. Numeric Variable
2. String (or) Non-numeric variable.

1. Numeric Variable

A quantity whose numeric value changes during the execution of a program is called Numeric Variable. Numeric Variable is one which takes numeric constants.

NOTES

Example:

20 LET D = 10

30 LET E = 20

In the above example D and E are numeric variable names, and 10 and 20 are numeric constants.

Rules to define a numeric variable are as follows:

a) The first character of numeric variable name should be an alphabet character.

b) Some basic versions allow a numeric variable to be a combination of alphabet and numbers, subject to a maximum of 31 characters out of which the first character should be an alphabet.

c) Special characters are not allowed except (-) symbol. It can be used in the middle portion of the variable name. (e.g.) 30 Gross – Pay = 10000.

2. String (or) Non-Numeric Variable

A quantity whose string value changes during the execution of a program is called string variable. String variable is one which takes string constant.

Example:

10 LET D$ = "RAJA"

20 LET E$ = 'RAHUL'

The above example states that D$ and E$ are string variable names, and "RAJA" and "RAHUL" are string constants.

Rules to define a string variable are

a. The first character of string variable name should be an alphabet character. A $ symbol should be added as a last character of every string variable name.
b. Some basic versions allow a string variable to be a combination of alphabets and numbers subject to a maximum of 31 characters out of which the first character should be an alphabet.
c. Special characters are not allowed except (-) hyphen.
d. Hyphen (-) symbol can be used in the middle portion of the variable name.

5.3.3. Constant

A quantity whose value does not change during the execution of a program is called constant.

Types of constant are:

1. Numeric constant and
2. String constant

Check your progress
Fill in the blanks

1. BASIC language is ____________ to learn and understand
2. In BASIC letters are used in ____________ form only
3. A quantity whose numeric value changes during the execution of a program is called ____________ variable.
4. A quantity whose value does not change during the execution of a program is called ____________
5. Operators are ____________ used to execute opeations in the computer system.

1. Numberic Constant:

a. It is assigned as value to a numeric variable.

b. It should be either an integer number (or) a real number.

c. A numeric constant can optionally have either a '+' (or) a '-' symbol as its first character.

d. No other special character and alphabets are allowed in coding a numeric constant. (eg.5678 is valid. 5,678 is invalid).

e. It can have a maximum of 6 characters.

f. If a numeric constant is too large (more than 6 characters), then it can be expressed in exponent notation.

2. String Constant:

It is a sequence of any characters (all alphabet characters, special characters, numbers, symbols etc) given within quotes. The maximum number of characters allowed may vary from system to system.

Valid Examples: "SIVA", "TVS 50"

Invalid Examples:- Siva, "VC

5.3.4. Operators:

These are symbols used to execute various operations in the computer system. They are classified as follows viz., (1) Arithmetic operators (2) Relational operators and (3) Logical operators.

1. Arithmetic operator represents either one of the following symbols viz., +, _, /, *, ^

2. Relational operator represents either one of the following symbols, viz <, >, =, <>, <=, >=.

3. Logical operator represents either one of the following symbols viz. AND, OR, NOT.

5.3.5. Expression:

In general, an expression is a combination of variables, constants and operator. There are four types of expressions in BASIC viz.,

1. Arithmetic Expression
2. Relational Expression
3. Logical Expression
4. String Expression

1. Arithmetic Expression

It is combination of Numeric Variables, Numeric Constants and Arithmetic operators. No two arithmetic operators should come together in an arithmetic expression.

NOTES

General Format:

<numeric variable / <arithmetic <numeric variable /

numeric constant > operator > numeric constant >

Valid Examples:

B*C

B+(-C)^2

Invalid Examples:

B*-C

2.Relational Expression:

It is a combination of Numeric Variables, Numeric Constants, and relational operators.

General Format:

<numeric variable / <numeric variable >

numeric expression > operator > numeric constant / numeric expression>

Valid Examples:

B>C

B<=C

Invalid Examples:

B?<C

D>+E

3.Logical Expression:

When two (or) more relational expressions combined by logical operators, it is called logical expression. It is a combination of variables, constants, relational operator, and logical operators.

General Format:

<relational<logical<relational

expression>operator> expression>

Valid Examples:

A>B AND A>C

B<C OR B<D

B NOT >C

Invalid Examples:

C AND OR D

C > D NOT

C < NOT D

NOTES

4. String Expression:

When two or more string variables / string constants are combined by using + symbol is called string expression. No other symbols can be used in string expression.

General Format:

<string variable / + <string variable /

string constant > string constant >

Valid Examples:

"RAJ" +"KUMAR"

B$ + C$

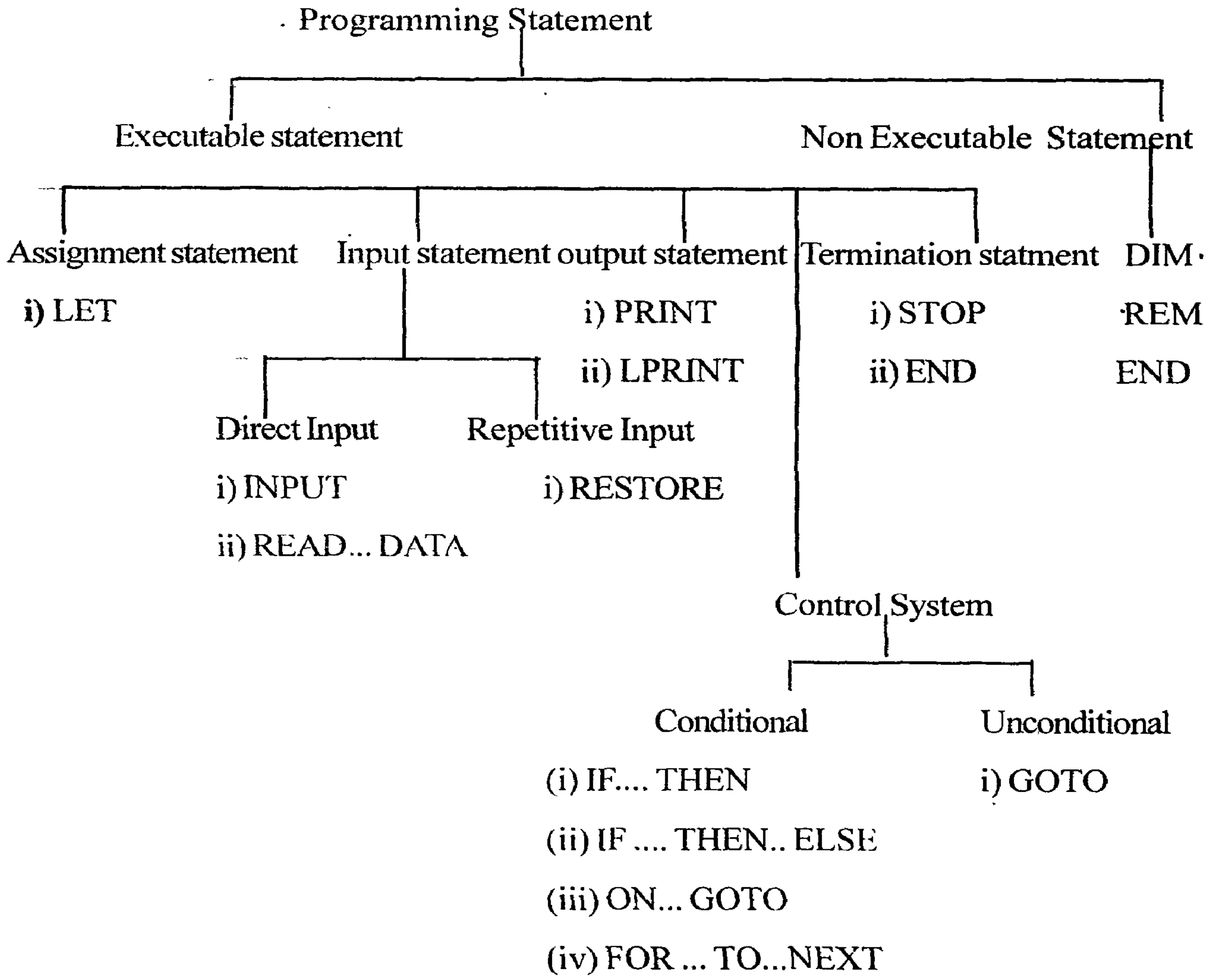
5.3.6. Statements

Basic programming statements are classified into two categories. They are

I. Non-executable statements

II. Executable statements

Non-executable statements do not give any executable instructions to the computer. They do not affect the results any way. They do not produce any result. It a statement provides any executable instructions to the computer, then it is called in an executable statement.



NOTES

I. Non-executable statements

The following are the important Non-executable command verbs.

a. REM statement

b. DIM statement

c. END statement

a.REM Statement:

This statement is used to give remarks in the program for the reference of the programmer and to improve the readability of a program. This is a dummy statement. It is ignored by the interpreter (or) compiler. It can be placed anywhere in a program. It can be extended to another line with start of REM.

Syntax:

<Line number>REM<user given text>

Example:

10 REM PROGRAM TO FIND INTEREST

b.DIM statement:

DIM is the short form of DIMENSION. It is used to allocate the memory locations in one dimensional as well as multi-dimensional arrays. The general format of DIM statement is:

Syntax:

<Line number> DIM <variable name>

Example:

10 DIM A (10), x (20)

c.END statement

This statement is used to indicate the physical and logical end of a program. Only one End statement is allowed in a program. It should be placed in the last line of every program.

Syntax:

<Line number> END

Example:

90 END

II. Executable Statements:

1.Assisgnment Statement: LET Verb

To compute an arithmetic expression, LET Verb is used. The keyword LET is not compulsory in every computation statement.

Syntax:

<Line Number> LET <variable> = <constant>

Example:

```
20 LET B = 10
30 LET N$ = "RAJ"
```

2. Input Statement:

In Basic, the following input statements are used.

a. INPUT Statement

b. READ..........DATA Statement

c. RESTORE Statement

a. INPUT Statement:

This statement is used to give input data to computer during program execution. Whenever an INPUT verb is executed in a program, the computer system displays a question mark (?) on the monitor and waits for the value(s)to be taken for variables.

Syntax:

<Line number> INPUT <"string">, <variable(s)>

Example:

```
10 INPUT "ENTER THE NAME", N$
20 INPUT "ENTER VALUES TO P, N, R", P, N, R.
```

b. READ...DATA Statement

In READ verb, list of variables are given. In DATA verb, list of values are given. READ verb instructs the computer system, to read the data from another verb called DATA verb which supplies the data corresponding to variables in the READ verb.

Syntax:

<Line number> READ <List of Variables>

....

....

<Line number> DATA <List of Constants>

Example:

```
10 READ A, B, C
30 DATA 10, 15, 20
```

For every variable in READ verb, corresponding value should be given in the DATA verb. If there is lack of data then the computer system will give an error message. The DATA verb may be placed anywhere is a program.

NOTES

c. RESTORE Statement:

Some problems require some of the data to e read more than once. To do this you must reset the pointer to the start of the data block. The RESTORE verb is used for this purpose.

Syntax:

<Line number> RESTORE

Example:

```
10 READ B, C, D
20 RESTORE
30 READ E, F
40 DATA 10, 15, 20
```

When the line number 10 is executed, the value for variable B, C, D will be assigned 10, 15, 20 from the DATA verb in line number 40. When the line number 20 is encountered the pointer reset and hence the value for variable E, F as stated in READ verb in line number 30, will be assigned 10 and 15 as stated DATA verb in line number 40.

3. Control Statements:

Control statements are of two kinds, viz.,

a. Unconditional Control Statement: GOTO verb

Unconditional control statement is used to transfer the control from one place to another part of the program without any condition. For this purpose, GOTO verb is used in the BASIC program. GOTO verb transfers the control from one place to another place without any condition.

Syntax:

<Line number> GOTO <Line number>

Example:

```
10 A=5
20 B = 7
30 B = B+A
50 GOTO 20
60 END
```

b.Conditional Control Statement or Branching Statement:

Conditional control statement is used to transfer the control from one place to another part of the program conditionally. For this purpose, the following verbs are used.

i. IF....THEN verb

ii. IF...THEN...ELSE verb

iii. ON...GOTO verb

NOTES

i.IF....THEN verb:

This is a decision making statement. If the condition given between the keywords IF and THEN is true, then the statement after THEN will be executed. If the condition is wrong, the control will skip to the next line.

General syntax:

<Line number> IF <condition> THEN <statements>

The above syntax explain that condition may be either relational condition (or) logical condition. Statement may be line umber, (or) assignment statement, (or) computation statement, (or) INPUT verb, (or) PRINT verb

Any one of the following syntax can be used according to the circumstances.

Syntax – 1:

<Line number> IF <condition> THEN <Line number>

This syntax-1 is used to transfer the control to any statement of the program depending upon a given condition.

Example:

60 IF I <100.THEN 30

Syntax-2:

<Line number> IF <condition> THEN <Assignment verb>

This syntax-2 is used to assign a value to a variable upon a given condition.

Example:

60 IF A>B THEN A=100

Syntax-3:

<Line number> IF <condition> THEN <Computation verb>

This syntax-3 is used to compute an arithmetic expression and assign the result of the same expression to a variable upon a given condition.

Example:

60 IF B>C THEN B=100

Syntax-4:

<Line number> IF <condition> THEN <INPUT verb>

This syntax-4 is used to get input data upon a given condition

Example:

80 IF A>B THEN INPUT C

Syntax-5:

<Line number> IF <condition> THEN <PRINT verb?

NOTES

This syntax-5 is used to display the output in the monitor upon a given condition.

Example:

90 IF A>B THEN PRINT "A IS BIGGER THEN B"

ii.IF...THEN...ELSE Statement:

This is a decision making statement. If the condition given between the keywords IF and THEN is true, then the statement between THEN and ELSE will be executed. If the condition is wrong, then the statement shown after ELSE will be execute.

<Line number> IF <condition> THEN <statement 1> ELSE <statement 2)

In the above syntax, condition may be either relational condition (or) logical condition. Statement may be line number, (or) assignment statement, (or) computation statement, (or) INPUT verb, (or) PRINT verb.

Example:

10 IF A>B THEN PRINT "A IS BIGGER" ELSE PRINT "B IS BIGGER"

iii.ON...GOTO Statement: (Branching Statement)

ON...GOTO verb is used for multiple branching. It is used to transfer the control according to the value of a variable (or) expression.

Syntax:

<Line number> ON <variable/expression> GOTO <LIST OF LINE NUMBERS>

Examples:

```
10 INPUT B
20 ON B GOTO 30, 40, 50
30 PRINT "ONE"
40 PRINT "TWO"
50 END
```

4.OUTPUT Statement:

PRINT Verb:

PRINT verb is used to display the result on the screen.

Syntax:

<Line number> PRINT <Constants>, <Variables>

Examples:

20 PRINT "NAME", N$

The following are the various forms of PRINT verb.

a. Print with Semicolon Option:

If the list of variables in the print verb are separated by semicolon, the values of the variables will be printed in a closed fashion.

NOTES

<Line number> PRINT <LIST OF VARIABLES SEPARATED BY SEMICOLON>

Example:

```
10 A = 10
20 B =20
30 C = 30
40 PRINT A; B; C
50 END
```

If the you run the above program then output is like as follows.

10   20   30

b.Print with comma option:

It the list of variables in the PRINT verb are separated by comma, the values of the variable will be printed in each zone consisting of 15 columns.

Syntax:

<Line number> PRINT <List of variables separated by comma>

Example:

```
10 B = 20
20 C = 40
30 D = 60
40 PRINT B, C, D
50 END
```

If you run the program then the output will be 20   40   60

c.Print the Message:

The print statement can be used to print the message (or) information in the screen. The message should be specified within the double quote symbols.

Syntax:

<Line number> PRINT <"MESSAGE">, <Varaible>

Example:

```
10 PRINT  "ALL ARE WELCOME"
20 PRINT  "SIMPLE  INTEREST", SI
```

d.Print with no List:

This print verb is used to create a line space in the screen

Syntax:

<Line number> PRINT

NOTES

Example:

```
20 PRINT "WELCOME"
30 PRINT
40 PRINT
50 PRINT "TO OUR HOME"
```

Output will be

```
WELCOME
TO OUR HOME
```

e.Semincolon or Comma at the end of print verb:

If semicolon at the end of PRINT verb, the printer pointer will not be shifted to the beginning of the next line. It can be explained by an example.

Example.

```
10 B =20
20 C = 40
30 D = 50
40 Print B;C;
50 Print D
60 End
```

Output will be

```
20      40      50
```

If comma is not placed at the end of Print verb, the printer pointer will be shifted to the beginning of the next line. It can be explained by an example.

```
10 B = 20
20 C = 40
30 D = 50
40 Print B, C
50 Print C
60 END
```

Output will be

```
20      40
50
```

f) Print with Tab functions:

In order to start printing the values from any desired column, BASIC allows a function, known as TAB function (Tabulation function).

Syntax:

<Line number> PRINT TAB (column number); <variable>

In the above syntax, column number should be an integer (or) an arithmetic expression.For each variable, a TAB function is to be given and separated by semicolon.

Example:

```
10CI =1000
20 PRINT TAB (10); "COMPOUND INTEREST", TAB (20);CI
```

Output:

The word COMPOUND INTEREST will be printed on the 10th column and the value of CI (i.e., 1000) will be printed on the 20th column.

g) Print using verb:

This verb is used to format the output.

Syntax:

<Line number> PRINT USING <"FORMAT CODE">; <Variable>

In the above syntax, format code may be any one of the following.

(hash)-for numeric digits with rounded

• (period) - for decimal point

* (asterik) - to fill left most digits with *

Example:

```
10 B = 5252.4954
20 PRINT USING "####.##"; B
30 N = 10000
40 PRINT USING "**"; N
50 END
```

Output will be

```
5252.50
**10000
```

5) Termination statement:

a) STOP statment. This statement terminates the progress temporaily. The program can be resumed by using "CONT" Command. There may be more than one STOP statements in a program.

The general format of STOP statement is syntax <Line No> stop

End statement,

The End statment is the last statment in a program. It indicates that the program is completed. It terminates the program permanently.

NOTES

The general format is:

Syntax:

<LINE NO> END

There should be only one END statement in a program.

5.7 LOOPING

Looping refers to the repeated use of one (or) more steps.

Types of Loops:

(1) Fixed Loops

(2) Variable Loops

(1) Fixed Loops:

It is one where operations/processing steps are repeated at a fixed number of times. Fixed loops can be executed by the following verbs.

(i) FOR...... NEXT Loop

(ii) IF...... THEN Loop and

(iii) WHILE......... WEND Loop

(i) FOR........NEXT Loop:

This verb is used to execute a set of statements with in the For...... **Next Loops** for a specified number of times.

Syntax: <Line number> For i=n1 to n2 step n3

<Line number> <statement 1>

<Line number> <statement 2>

....

<Line number> <statement n>

<Line number> NEXT 1

I represents a running numeric variable

n1 represents the initial value for the numeric value i.

n2 represents the final value for the numeric value i.

n3 represents either incremental (or) decremental vlaue of the numeric value i.

Example:

```
10 FOR I=1 TO 5
20 PRINT "THANK YOU"
30 NEXT I
40 END
```

The above program executes the line number 20 and print the word "Thank You" for 5 times in the screen.

NOTES

(ii) IF........... THEN Loop:

This verb is used to execute a set of instructions for a specified number of times.

Syntax:

<Line number> <Condition>THEN<LINE NUMBER>

Example:
```
10 I =1
20 PRINT "WELCOME TO OUR HOME"
30 I = I + 1
40 IF I < = 10 THEN 20
50 END
```

In the above example, line numbers 20 and 30 will be repeatedly executed until the condition I<10 becomes false.

(iii) WHILE............. WEND Loop:

This verb is used to execute a set of statments with the while........ wend loop for a specified number of times.

Syntax:

```
<Line number> WHILE <Condition>
          Statement 1
          Statement 2
          ..................
          Statement n
<Line number> WEND
```

In the above syntax, statements 1,2,................n, will be repeatedly executed, when the given condition after the keyword WHILE has a true value. When the value of the condition is false, the control will be shifted to the next statement after WEND statement. Here the condition may be either relational condition (or) logical condition.

Example:
```
10 I = 1
20 WHILE I < = 10
30 PRINT "WELCOME TO ALL"
40 I = 1 + 1
50 WEND
60 END
```

NOTES

Output of the above program will repeatedly print the word "WELCOME TO ALL" for 10 times until the condition shown in the while verb becomes false.

b) Variable Loop:

Variable loop is one where the operations are repeated until a specified condition is met. Here the number of times i.e., loop may vary in accordance with the satisfaction of the given condition.

Syntax:

<Line number> IF <Condition> THEN <Line number>

Example:

```
10 OPT = "YES"
20 INPUT "ENTER YOUR OPTION YES OR NO", OPT $
30 IF OPT$ = "YES" THEN 50
40 GOTO 20
50 PRINT "YOU ARE ADMITTED"
60 END
```

6. When relational expressions combined by logical operators, it is called ________ expression.
7. DIM is the short form of ________
8. GOTO statement is an ________ control statment.
9. END statement terminates the program ________
10. The repeated use of one or more steps is known as ________

In the above example, the control will be repeatedly transferred from line number 40 to line number 20 if the condition in line number 30 becomes false. Line number 50 will be executed and program will be ended when the condition in line number 30 becomes true. So that the repeated action may vary in accordance with given condition in line number 30 becomes true. So that the repeated action may vary in accordance with given condition in the IF .... THEN verb.

Nested Loop:

One loop can be tested with another, if desired. Nested loop can be created by any one of the following loop.

a) Nested For Loop.

b) Nested If Loop.

a) Nested FOR Loop:

One (or) more FOR LOOP can be included within the scope of another FOR LOOP. This is called Nested For Loop.

Syntax:

```
10 FOR I = n1 TO n2 STEP n3
   ............
   ............
40 FOR J= m1 TO m2 STEP m3
   ............
   ............
70 NEXT J
80 NEXT I
```

In the above syntax

n1 refers to the initial value of I.

n2 refers to the final value of I.

n3 refers to the incremental (or) decremental value of I.

m1 refers to the initial value of J.

m2 refers to the final value of J.

m3 refers to the incremental (or) decremental value of J.

Rules of Next For Loop are as follows:

(i) Each nested loop must begin with its own FOR statement and end with its own NEXT statement.

(ii) An outer loop and inner nested loop cannot have the same running variable.

(iii) The Loops cannot be overlapped.

(iv) Control can be transferred from an inner loop to an outer loop.

(v) Control cannot be transferred from an inner loop to the outside the outer loop.

b) Nested IF Loop:

One (or) more IF statements can be included within the scope of another IF statement. This is called Nested If Loop.

Example:

```
10 I =1
20 J =1
30 PRINT "WELCOME
40 J = J + 1
50 IF J <=2 THEN 30
60 I = I + 1
70 IF I < = 3 THEN 20
80 END.
```

In the above example, line number 30 will be executed for 6 times by the execution of Nested IF in line numbers 50 and 70.

5.8 KEY TERMS

- Character : Any letter, number or symbol produced on key board for display on a VDU
- Constant : A value or an item of data that is fixed and cannot change or be changed.
- Variable : A Quantity that can take an any of a set of values
- Operator : A symbol representing the operation to be performed

NOTES

- Expression : A representation (arithmetic logical, relational etc) of a value
- Statement : The basic building block of a programming language. It represents a step in a sequence of instruction.
- String : A sequence of letters, digits, characters or otner elements of the same nature
- Loop : An instruction which is executed repeatedly for a specified number of times.

5.9 SUMMARY

BASIC is a user friendly high level language. it is easy to learn and simple to understand. For wirting BASIC programs you have to use only upper case letter. Durign teh execution of the program when the value of a quanitity changes, it is called variable and when it does not change it is known as constant operators are the symbols. Expression is a combination of variables, constatns and operators. The expressions are of fl types viz.. Arithmetic, Relational Logical and string. Executable statments give instructions to the computers. Non executable statments viz REM, DIM and END do not give any executable instructions. Looping is used to execute a sot of statments repeatedly. Fixed loops are used to execute a sot of statments for a specified number of times whereas the variable loops are repeated until a specified condition is met with.

5.10 ANSWERS TO CHECK YOUR PROGRESS

1) Easy	2) Upper case	3) Variable,	4) Constants	5) Symbols
6) logical	7) Dimension	8)Unconditional	9) permanently	[illegible]

5.11 QUESTIONS/EXERCISES

Section - A

1. What is constant? Explain its types in BASIC
2. Explain FOR..... NEXT statment with an example.
3. Explain different types of INPUT statments in BASIC
4. Define variable. Explain its types.
5. Discuss the different form of PRINT statment in BASIC

Section - B

6. Write a BASIC program of find the following SUM = 1+3+5+7+.........+99
7. Write a BASIC program to find the smallest number among N numbers.
8. Describe the different types of Loop statments in BASIC with example.

5.12 FURTHER READING

1. Computer Programming in Basic - E. Balagurusamy - PHI Learning Private Ltd, New Delhi 110 001.

2. Computer Programming in Basic - S. Velayuthampillai - Emerald, Chennai.

NOTES

UNIT 6 PROGRAMS IN BASIC

NOTES

STRUCTURE

6.1 Introduction
6.2 Unit Objectives
6.3 Example Programs in Basic
6.4 Questions/Exercises

6.1 INTRODUCTION

In unit 6, you have studied the BASIC language. You have also studied the BASIC statements and learned about looping. After studying the theoritical aspects of the BASIC language, one should apply the same in writing the programmes. In this unit, examples in BASIC programmes have been discussed. Model questions are given to improve your understanding in BASIC programming.

6.2 UNIT OBJECTIVES

After going through this unit, you will be able to:

- Explain the procedure in writing BASIC programmes.
- Write programmes in BASIC language.

6.3 EXAMPLE PROGRAMS IN BASIC

Write a Basic Program to

1. Calculate Simple Interest and Compound Interest from the given INPUT values for Principal amount, Number of Years and Rate of interest:

```
10 REM TO FIND SI & CI
20 INPUT "ENTER THE PRINCIPLE AMOUNT", P
30 INPUT "ENTER THE NUMBER OF YEARS", N
40 INPUT "ENTER THE RATE OF INTEREST", R
50 LET SI = P*N*R/100
60 LET CI = P*(1+R/100)^N-P
70 PRINT "SIMPLE INTEREST IS", SI
80 PRINT "COMPOUND INTEREST IS", CI
90 END
```

2. Find the selling price of a commodity whose cost price and profit percentage are given:

Formula: Selling Price = Cost Price x (100 + Profit Percentage/100)

```
10 INPUT "COST PRICE AND PROFIT PERCENTAGE", C,P
20 S = C* ((100+P)/100)
```

```
30 PRINT "SELLING PRICE", S
40 END
```

3. Find the cost price of a commodity whose selling price and profit percentage are given:

Formula : Cost price = Selling Price / ((100+Profit Percentage)/100)

```
10 INPUT "SELLING PRICE AND PROFIT PERCENTAGE", S,P
20 C = S /((100+P)/100)
30 PRINT "COST PRICE", C
40 END
```

4. Find the average of given 5 different numbers:

```
10 READ A, B, C, D, E
2O LET AVE = (A+B+C+D+E)/5
30 PRINT "AVERAGE", AVE
40 DATA 23, 24, 45, 64, 69
50 END
```

5. Find the average marks in a subject for N number of students:

```
10 INPUT "ENTER N DIFFERENT NUMBERS", N
20 S = 0
30 FOR I = 1 TO N
40 INPUT "ENTER THE MARK", M
50 S = S+M
60 NEXT I
70 AVE = S/N
80 PRINT "THE AVERAGE MARKS ARE:", AVE
90 END
```

6. Find the biggest number among three different numbers:

```
10 INPUT "ENTER THE VALUES FOR A, B, C," A, B, C
20 IF (A>B) AND (A>C) THEN BIG = A
30 IF (B>A) AND (B>C) THEN BIG = B
4C IF (C>A) AND (C>B) THEN BIG = C
50 PRINT "THE BIGGEST NUMBER IS", BIG
60 END
```

NOTES

7. Find the biggest number among three different numbers using IF......THEN....ELSE verb:

```
10 INPUT "ENTER THE VALUES FOR A, B. C", A, B, C
20 IF A>B THEN BIG = A ELSE BIG =B
30 IF B>C THEN BIG = B ELSE BIG =C
40 PRINT "THE BIGGEST NUMBER IS", BIG
50 END
```

8. Find the biggest number among N different numbers:

```
10 INPUT "ENTER THE VALUE FOR N:", N
20 BIG = 0
30 FOR I = 1 TO N
40 INPUT "ENTER A NUMBER FOR M:", M
50 IF M>BIG THEN BIG =M
60 NEXT I
70 PRINT "THE BIGGEST NUMBER AMONG N DIFFERENT NUMBER IS", BIG
80 END
```

9. Find the smallest number among N different numbers:

```
10 INPUT "ENTER N DIFFERENT NUMBERS", N
20 INPUT "ENTER THE FIRST NUMBER", SMALL
30 FOR I =1 TO N-1
40 INPUT "ENTER THE SUBSEQUENT NUMBER", M
50 IF M<SMALL THEN SMALL =M
60 NEXT I
70 PRINT "THE SMALLEST NUMBER AMONG N DIFFERENT NUMBERS", M
80 END
```

10. Find the sum of natural numbers upto given N value. Using IF verb:

```
10 INPUT "ENTER THE VALUE FOR N", N
20 S =0
30 I =1
40 S = S+1
50 I = I +1
60 IF I<=N THEN 40
```

```
70 PRINT "SUM OF NATURAL NUMBER:", S
80 END
```

11. Find the sum of natural numbers upto given N value, Using FOR .... NEXT verb:

```
10 INPUT "ENTER THE VALUE FOR N", N
20 S = 0
30 FOR I =1 TO N
40 S = S+1
50 NEXT I
60 PRINT "SUM OF NATURAL NUMBER", S
70 END
```

12. Find the sum of odd number upto given N value. Using IF verb:

```
10 INPUT "ENTER THE VALUE FOR N", N
20 S = 0
30 I = 1
40 S = S+1
50 I = I +2
60 IF 1<=N THEN 40
70 PRINT "SUM OF ODD NUMBER:", S
80 END
```

13. Find the sum of odd numbers upto given N value: Using FOR.....NEXT verb:

```
10 INPUT "ENTER THE VALUE FOR N", N
20 S = 0
30 FOR I = 1 TO N STEP 2
40 S = S+1
50 NEXT I
60 PRINT "SUM OF ODD NUMBER", S
70 END
```

14. Find the sum of even numbers upto given N value. Using IF verb:

```
10 INPUT "ENTER THE VALUE FOR N", N
20 S = 0
30 I = 2
40 S = S+1
50 I = I+2
60 IF I<=N THEN 40
```

NOTES

```
70 PRINT "SUM OF EVEN NUMBER:", S
80 END
```

15. Find the sum of even numbers upto given N value. Using FOR....NEXT verb:

```
10 INPUT "ENTER THE VALUE FOR N", N
20 S = 0
30 FOR I = 2 TO N STEP 2
40 S = S+1
50 NEXT I
60 PRINT "SUM OF EVEN NUMBER", S
70 END
```

16. Find the sum of factorial numbers upto given N value. Using IF verb:

```
10 INPUT "ENTER THE VALUE FOR N", N
20 S = 1
30 I = 1
40 S = S*I
50 I = I +1
60 IF I<=N THEN 40
70 PRINT "SUM OF FACTORIAL NUMBER:"; S
80 END
```

17. Find the sum of factorial numbers upto given N value: Using FOR....NEXT verb:

```
10 INPUT "ENTER THE VALUE FOR N", N
20 S = 1
30 FOR I = 1 TO N
40 S = S*1
50 NEXT I
60 PRINT "SUM OF FACT-NUMBER", S
70 END
```

18. Find whether the given number is prime or not:

```
10 INPUT "ENTER A NUMBER", N
20 C = 0
30 FOR I = 2 TO N-1
40 IF N MOD I = 0 THEN C = C+1
50 NEXT I
60 IF C=0 THEN PRINT "THE GIVEN NUMBER IS PRIME". ELSE PRINT
```

NOTES

"THE GIVEN NUMBER IS NOTPRIME"

70 END

19. Find the sum of digits for a given number:

```
10 INPUT "ENTER A NUMBER AS STRING", N$
20 S = 0
30 FOR I = 1 TO LEN(N$)
40 S = S + VAL (MID$(N$, I, 1) ^3
50 NEXT I
60 PRINT "SUM OF DIGITS"S TO END= S THEN PRINT "GIVEN NUMBER
                                   IS ARMSTRONG"
                                   ELSE PRINT "GIVEN NUMBER
                                   IS NOT ARMSTRONG"
70 END
```

20. Find whether the given number is armstrong or not:

```
10 INPUT "ENTER A NUMBER AS STRING",N
20 S=0
30 FOR I= 1 TO LEN (N$)
40 S=S+VAL (MID $ (N$, i, 1) ^3
50 NEXT I
```

21. Find whether the given year is leap or not:

```
10 INPUT "ENTER THE YEAR", Y
20 IF (Y MOD 4 = 0) AND (Y MOD 100<>0) OR (Y MOD 400=0) THEN
30 PRINT "THE GIVEN YEAR IS NOT LEAP YEAR"
40 GOTO 60
50 PRINT "THE GIVEN YEAR IS A LEAP YEAR"
60 END
```

22. M/s. VIVEK FINANCE CO. has the following interest rate for a deposit scheme:

Less than Rs.1000	10%
Between Rs:1000 and Rs.1999	11%
Between Rs.2000 and Rs.2999.	12%
Between Rs.3000 and Rs.3999	13%
ABOVE Rs.4000	14%

Write a program to find the maturity amount, (given year as 'N') using the formula $A=P(1+R/100)^N$, with the help of ON ..... GOTO statement.

NOTES

```
10 INPUT "ENTER THE PRINCIPAL AMOUNT AND NUMBER OF YEARS", P,N
20 ON (P/1000+1) GOTO 30, 40, 50, 60, 70
30 R = 10 : GOTO
40 R = 11 : GOTO
50 R = 12 : GOTO
60 R = 13 : GOTO
70 R = 14 : GOTO
80 A = P*(1+R/100)^N
90 PRINT "MATURITY AMOUNT FOR": P; "=RS.";A
100 END
```

23. Print a given multiplication table:

```
10 INPUT "ENTER A MULTIPLICATION TABLE NUMBER", M
20 FOR I = 1 TO 10
30 S = I * M
40 PRINT I; "*"; M; "="; S
50 NEXT I
60 END
```

6.4 QUESTION/EXCERCISES

Section-A

1. Write a program to print all even numbers between 1 and 20
2. Write a Basic Program to find the smallest number among N numbers.
3. Write a program to sum the squares of even number between 1 and 20.
4. Write a program to find the sum of N given numbers.
5. Write a Program to find the mean of given 10 numbers.

Section - B

6. Write a program to find the sum of N given numbers.
7. Write a program to add two given matrix.
8. Write a program to arrange the numbers in Alphabetical order.

UNIT - 7 SPREAD SHEET

Notes

Structure

7.1 Introduction

7.2 Unit Objectives

7.3 Advantages of Spread sheets

7.4 Spread sheet screen

7.5 Entering Data in a Spread sheet

7.6 Editing cells

7.7 Saving the work sheet

7.8 Key Terms

7.9 Summary

7.10 Answers to check you progress.

7.11 Questions/Exercises

7.12 Further Reading

7.1 INTRODUCTION

Spreadsheet is an electronic worksheet. It is used to store information in the memory of a computer. The spreadsheet will ask the computer to calculate results and display on the computer screen. In other words, it replaces the normal paper sheet, pencil, eraser and calculator. In such a worksheet, information is entered through the keyboard and displayed on the screen. The information already entered in the worksheet can be changed very easily. If some information is altered, the worksheet automatically recalculates the results. The information entered in the worksheet can also be printed.

You can store all kinds of information in the worksheet. Some common applications are.-

- Budgets
- Annual reports of business firms
- Income statement and income tax calculations
- Payrolls
- Invoices
- Accounts payable and receivable
- Production and marketing analysis
- Investment and loan analysis
- Banking
- Inventory control
- Cost effect analysis (using IF.... THEN)

Notes

7.2 UNIT OBJECTIVES

After going through this unit, you will be able to

- List the advantages of spread sheets.
- Explain the spread sheet screen
- Explain the procedure for entering data
- Learn how to edit cells
- Learn the procedure to save the work sheet.

7.3 ADVANTAGES OF SPREAD SHEETS

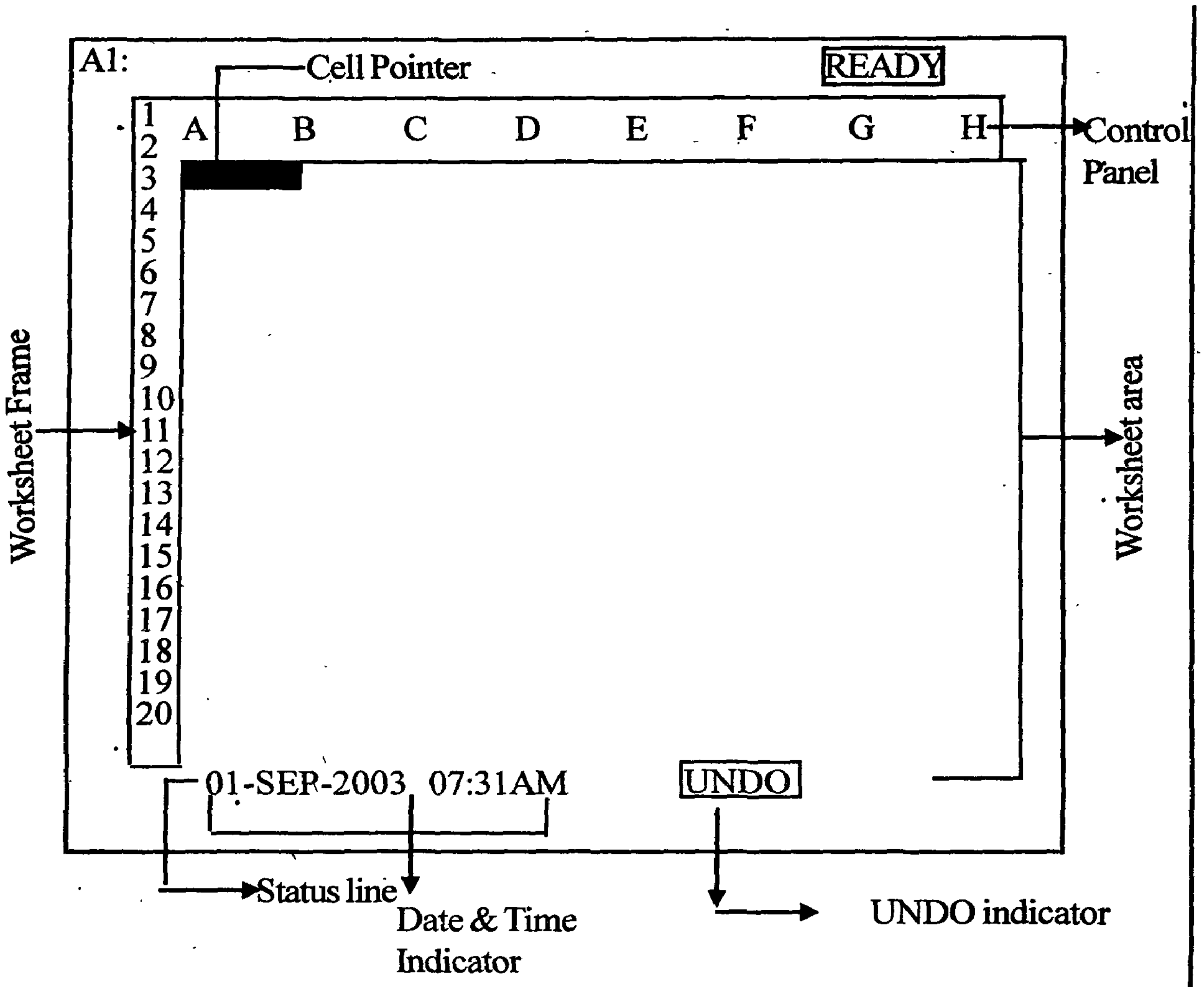
Spreadsheet replaces the normal paper sheet, pencil, eraser and calculator. Using an electronic spreadsheet offers several advantage over the paper counter-parts. If you change a figure, the spreadsheet program automatically recalculate all the formula using that figure and instantly update the spreadsheet. The electronic spreadsheet generally offers the following features.

1. Mathematical, trigonometric, financial and statistical functions are build in. Hence all sorts of complicated calculations can be performed easily using these functions.
2. The results are accurate.
3. The size of the spreadsheet is very big. Any part of it can be viewed or edited.
4. Data can be viewed in the form of different graphs.
5. The whole or part of the spreadsheet can be printed.
6. The spreadsheet can be saved in a file. Hence it can be retrieved.
7. One spreadsheet or part of it can be merged with another.
8. Reports can be quickly prepared. Answer to "What - if" questions can also be received.
9. Information stored in a spreadsheet can be transferred to another software programs and vice-versa.

7.4 SPREAD SHEET SCREEN

To get into spreadsheet take the 1-2-3 option from the access screen, the monitor displays a blank worksheet, similar to one shown in figure.

Notes



The screen comprises of READY symbol at the right hand top corner of the spreadsheet. Date and Time are displayed at the bottom left corner. The spreadsheet is a matrix of cells. The rows are numbered in order from 1 and constitute 8192 rows and columns from A to Z, AA, AB .... and so on, to a total 256. The screen can accommodate only 20 rows and 8 columns due to size limitations. The screen is divided into three parts.

1. The Control Panel
2. The Spreadsheet (worksheet) area.
3. The Status Line.

1. The Control panel:

The top three rows are called the control panel. The information displayed on the control panel is useful when you are working on 1-2-3. The control panel displays informations such as.

i) The address and contents of the current cell.

ii) The information being entered in the current cell.

iii) The menu.

iv) Prompt message.

v) The status of the Spread Sheet through the mode indicator.

Notes

2. The Spreadsheet area:

The middle portion of the screen is called the spreadsheet area. Here data are entered and the calculated results are displayed. The spreadsheet area is a grid of rows and columns. It has a highlighted border on the top and left side known as spreadsheet frame.

3. The status line:

The last line on the screen is called the status line. The line displays.

i) The current date and time

ii) Error message

iii) Status of special keys.

iv) status of UNDO.

7.5 ENTERING DATA IN A SPREAD SHEET

You can enter any kind of data in a cell by typing. Move the cell pointer to a cell, type the entry and press RETURN. When you press RETURN, 1-2-3 completes the entry and moves the cell pointer to another cell in the direction of the pointer movement key. A cell accepts three types of data.

i) Labels

ii) Numbers

iii) Formule

Check Your Progress

1. The Spread sheet is an ________ worksheet.
2. The top three rows of the worksheet are called as the ____________
3. The last line on the screen is called the ____________ line.
4. A label is a ______ entry.
5. Label entries are ______ aligned

i) Entering Labels:

A label is a text entry. All kinds of textual information such as the name of a person, thing, city etc is a label. The maximum length of a label can be 240 characters. A label can contain number character, as long as the first character is a label-prefix character. When you enter the first character, the mode indicator changes from READY to LABEL. When you complete a label entry, the mode indicator changes back to READY. Beginning an entry with a label-prefix character determines, how the entry is aligned in the cell. There are three choices for the label - right aligned, centered and left aligned. A label, when typed, aligns on the left edge of a cell.

As an illustration, let us enter the following data on the spreadsheet.

MARK STATEMENT

SUBJECTS	MAXIMUM	SCORED
Environment	100	65
Accounting	100	60
Banking	100	68
Computer	100	75
Total	400	268

Notes

Enter the label "Mark Statement" in the spreadsheet. Since the cell pointer is in cell A1, the information is stored in that cell itself. As soon you are start typing, the made indicator changes from READY to LABEL. After entering the label, press return key.¯Å The computer displays "Mark Statement" in cell A1 and in the first line of the control panel.

Now move the cursor down using the down arrow key E twice to cell A3. Enter "Subject". Again press E twice to cell A5. Enter "Entertainment". Again press E once and the cell pointer is positioned in cell A6. Enter "Accounting" and so on till "computer".

Now press home key. The key will take the cell pointed to the cell A1. Now press right arrow key E to move cell B1 and then Press E to move to cell B3. Enter the label "Maximum". Similarly move to C3 cell and fill cell C3 with "Scored". On this you get the spreadsheet a shown in figure.

A Worksheet with label and lables entries

```
A8:computer                                   READY
     A            B        C     D   E   F   G   H
1.  MARKS STATEMENT
2
3   SUBJECT MAXIMUM SCORED
4
5    Environment
6    Accounting
7    Banking
8    Computer
9
10
11
12
13
14
15
16
17
18
19
20   01-SEP-2003  07:35 AM        UNDO
```

(ii) Entering Numbers (Values)

A number entry must begin with 0 1 2 3 4 5 6 7 8 9 + - $ C and decimal point. It can contain upto 240 characters. It cannot include space or commas. It can have not more than one decimal point. It can begin with a currency symbol ($) or other non alphabetic currency character and can end with % to indicate a percentage.

When you enter the first character of a number, the mode indicator on the right of the screen changes from READY to VALUE. A number aligns on the right edge of a cell.

Notes

For entering the numbers in the above illustration, move the cursor to B5 to B6 and enter with 100. Similarly move to C5 to C8 cells and enter the scored marks respectively. It you have to enter labels such as 22nd, the computer will not accept it. To enter a label-prefix character. On entering the values, you get the Spread Sheet as shown in figure.

A Worksheet with label and value entries

C8:75 READY

	A	B	C	D	E	F	G	H
1	MARKS	STATMENT						
2								
3	SUBJECT	MAXIMUM	SCORED					
4								
5	Environment	100	65					
6	Accounting	100	60					
7	Banking	100	68					
8	Computer	100	75					
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20	01-SEP-2003	07:40AM	UNDO					

(iii) Entering Formula

A formula is an instruction to calculate with numbers or text. A formula must begin with one of the following characters.

0 1 2 3 4 5 6 7 8 9 . + (@ # $.

It can contain between 1 to 240 characters. It cannot contain spaces except within a range name or a text string. It must begin with a plus sign (+).

When you enter the first character of a formula, the mode indicator on the top right at the screen changes from READY to VALUE. When you complete the formula, the mode indicator changed back to READY.

When you complete the formula entry, the result appears in the worksheet itself. For example, if you enter the formula 25+35, after the entry, the value 60 appears in the cell.

Lotus 1-2-3 allows three types of formulas:

i) Arithmetic formula - Calculate with numeric values using the arithmetic operators.

ii) Text formula - Calculates with label using the text operators (the ampersand character)

iii) Logical formula — Compare values in two or more cells using the logical operators. A logical formula is a statement that produces a value, that is either 0 (meaning FALSE) or 1 (meaning TRUE)

To enter the formula, the cell addressing (numbering) is very important. In our illustration, the formula for calculating the total marks obtained is C5+C6+C7+C8. The formula is entered as follows:

- Move to cell pointer to C10
- Type +C5+C6+C7+C8
- press

The computer immediately displays the result i.e., 268 in the corresponding cell. The computer does not display the formula in cell C10 but only its results. Once the data has been entered in a Spread Sheet, 1-2-3 automatically recalculates the results of formulas whenever any figure is changed. On entering the formula, you get the spreadsheet as shown in figure.

Entering a formula in worksheet

C10: +C5+C6+C7+C8 READY

	A	B	C	D	E	F	G	H
1	MARKS	STATMENT						
2								
3	SUBJECT	MAXIMUM	SCORED					
4								
5	Environment	100	65					
6	Accounting	100	60					
7	Banking	100	68					
8	Computer	100 .	75					
9	TOTAL		268					
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20	01-SEP-2003 07:45AM		UNDO					

7.6 EDITING CELLS

When you enter data in a worksheet, 1-2-3 left-align label-entries and right-align values in the cells. If you want to format a label in cell, you have to use a left-prefix character, before entering the actual data for cell. The label-prefix are of three kinds.

(i) ' (Apostrope) - left aligns a label

(ii) " (Quotation mark) - right aligns a label

Notes

(iii) ^ (caret) - centers a label

If you do not type a label prefix character, 1-2-3 automatically prefixes an apostrophe (') to the label. The general display of the label is as follows:

Cabel Prefix Character	Label entered in the cell	Display of label in the cell
'	'TOTAL	TOTAL
"	"TOTAL	TOTAL
^	^TOTAL	TOTAL

When you want to enter labels which begin with numeric characters (e.g. 100th Day), you have to type a label-prefix character before entering such labels. When you enter an incorrect character is a cell, 1-2-3 change the mode indicator to EDIT and cursor is positioned at the character it identifies as incorrect. This facilities to edit the label.

7.6.1 Editing Data in a Cell:

To edit a data in a particular Cell, you have to position the cell pointer in that cell and press F2 (Edit). To illustrate, the word 'maximum entered in cell B3 as a left aligned one has to be changed to right-aligned label. The movement are as follows.

- Move the cell pointer to cell B3

  Control panel displays 'maximum in the first row

- Press F2 (Edit)

  Control panel displays 'maximum in the second row MADE indicator changes to EDIT

- Press HOME

  Curser moves on in 'maximum

- Press del

  To delete'

- Type "

  Control panel will display "maximum

- Press ↵

  you can see the right aligned maximum in cell B3

7.6.2 Using commands and functions:

1-2-3 has several built-in commands. The commands are available through a menu There are two ways of selecting a command in the menu.

(i) High lighting the desired command and then pressing ↵

(ii) Typing the first letter of the desired command.

Notes

To invoke the mean press / (right slash key) < 1-2-3 displays a menu in the control panel as follows.

```
  ┌─[Worksheet] Range Copy Move File Print Graph Data System Add-in Quit
 ─┤─ Global Insert Delete Column Erase Titles Window Status Page Learn
 │└──────── Main Menu
 │
 └──────────────       Worksheet Menu Commands
```

The first line in the menu displays the main menu choices. Initially first choice (worksheet) is highlighted. The secondline in the menu displays the sub-groups of commands available under the highlighted choice. You can select other menu using the arrow keys.

7.6.3 Changing column width:

The standard width size of the column is nine characters. If we want to display a longer label or number, the following steps are followed.

- Highlight worksheet
- Press ↵ to select it
- 1-2-3 displays the following menu

Global Insert Delete Column Erase Titles Window Status Page Learn
Formal Label-Prefix Column-width Recalculation Protection Default Zero

- Press right arrow key to highlight column
- Press ↵ to select it
- 1-2-3 displays a new menu

Set-width Reset-width Hide Display Column-Range
Specify width for current column

- Press ↵ to select set width

  The current width of the column is displayed and prompts for the new width - "enter column width (1., 240):9"
- Type the new width
- Press ↵

  The width of the column changed to the new width.

Note: i) Before changing the column width, the cell pointer must be positioned in that column

ii) After changing the column width the new column width is displayed.

1-2-3 has many built-in functions. The functions may be applied to a single cell or a range (group) of cells. A range is any rectangle area in a worksheet. A range is defined by specifying the first and last cell in it. When a range includes cells from multiple columns and rows, the diagonally opposite corner cells are used to specify it. If the range is large, you can specify the range address by pointing to that area.

Notes

The @ sum functions is used to calculate the sum of numbers in a range. Let us use this function to calculate Total marks for the range B2..B5 in the illustrated worksheet.

- Move the cell pointer to cell A6 and type TOTAL.
- Press '- to move the cell to cell B6.
- type @ sum (B2..B5)
- Press ↵

1-2-3 displays the sum of marks in cell B6.

The @ IF functions can be used to take decisions based on a condition. Consider the following illustration.

"If the gross total of items purchased is more than Rs.4000, he is entitled to a 20% discount and otherwise a 10% discount".

There are two conditions and two formulas are needed to solve the conditions. Since you cannot use two formulas in a cell, you can use a flexible formula with the @ IF function. The syntax is.

@ IF (condition, true-value, false-value)

This function check the condition. If the condition is evaluated is true it returns true value, else, it returns false value. Consider the following function.

@ IF (+B 11>4000, 0.20, 0.10).

1-2-3 checks the contents of cell B11. If it contains a value which is more than or equal to 4000, it display the true-value (0.20). otherwise it displays the false-value (0.10)

Check your progress
Fill in the blanks
6. The standard width size of the column is ________ characters.
7. The @ sum function is used to calcuate the __________ of numbers
Say true or false
8. Cabols have been stored in the RAM of the computor.
9. Ram is non-volatile.

7.7 SAVING THE WORKSHEET

The labels and values feeded to the worksheet have been stored in the Random Access Memory (RAM) of the computer. Since RAM is volatile, the worksheet must be saved as disk file or a hard disk. The commands for saving and retrieving a worksheet are available under FILE in the main menu.

- Press / (or) < to invoke the main menu.
- select file by highlighting file or pressing F
- press ↵ to display a new menu

Retired Save Combine Xtract Erase List Import Director Admin
Erase the current worksheet from memory and display the selected worksheet.

- Highlight save

1-2-3 displays the following message

"Store the entire worksheet in a worksheet file"

- press ↵ to select save
- Assign a name to the worksheet and type it.

Notes

press ↵

Mode indicator changes to WAIT and after saving the worksheet in the file it displays READY

The worksheet is saved. 1-2-3 automatically adds the extension name "WKI" to the worksheet files.

7.8 KEY TERMS

* Spread sheet	-	A wroksheet used in a computer to create and analyse interrelated column reports in work spaces.
* Label	-	Texual information entered into a worksheet.
* Value	-	Number entry into a worksheet.
* Cell	-	An area at the intersection of a row and column.
* Built -in-command	-	Commands which are stored in the computer for easy operation.
* Volatile memory	-	Memory that loses its contents when power is shutoff.

7.9 SUMMARY

Spread sheet is an electronic worksheet. One can store all kinds of information in the worksheet. Screen consists of three parts viz., control panel, worksheet area and status line. You can enter data in the form of labels, Numbers and Formula into the spreadsheet. The label entries are left aligned and the numbers are right aglined. The label Profix are used to format a label in the cell of the spread sheet. By using the commands and functions, you can change the width of the column. After entering the required data, the worksheet is saved. The system automically adds the extensim name "WKI" to the worksheet files.

7.10 ANSWERS TO CHECK YOUR PROGRESS

1) Electronic	2) Control Panel	3) Status	4) text	5) left
6) 9	7) total	8) T	9) F	

7.11 QUESTIONS /EXERCISES

Section - A

1. Explain the different parts of screen in sreadsheets.
2. Explain how will you enter label and Number in a Worksheet.
3. Write any 5 statistical and 5 mathematical functions.

Notes

Section - B

4. What are the uses of spread sheets? How will you change the column width of a worksheet?

5. Explain how will you edit data in a cell of a spread sheet.

7.12 FURTHER READING

1. PC Software Made Simple - Ravi Kant Taxali - Tata McGraw-Hall publishing company Limited, New Delhi.

2. LOTUS 1-2-3 Made simple- Ravi Kant Taxali and Pardeep Chopu - Tata McGraw-Hall Publishing Company Limited, New Delhi.

UNIT – 8 GRAPHS

NOTES

Structure

8.1 Introduction
8.2 Unit Objectives
8.3 Creating Graphs
8.4 Using Data and Time
8.5 Using Time in Worksheet
8.6 Naming Ranges
8.7 Using Statistical Functions
8.8 Using Mathematical Functions
8.9. Using Financial Functions
8.10 Key-Terms
8.11 Summary
8.12 Answers to Check Your Progress
8.13 Questions / Exercises

8.1 INTRODUCTION

Worksheets generally contain more numeric data. Hence it becomes different to accurately analyse them and to take a correct decision. In such cases the facility to represent data in the form of graphs comes handy. Because graphs convey the message clearly and quickly. They play a very important role in the business world. Lotus 1-2-3 allows you to see graphs on the screen as well as to print them on a graphic printer.

8.2 UNIT OBJECTIVES

After going through this unit, you will be able to

- List the different types of graphs that can be created.
- Use data and time in worksheets
- Use mathematical function in worksheets
- Apply financial functions in worksheets
- Create and view the required graph.

8.3 CREATING GRAPH

Lotus 1-2-3 supports five different types of graphs viz., Line, Bar, Stacked Bar, Pie and XY. Creating a graph involves the following steps.

- Activate the graph command
- Specify the range to be plotted
- State the graph type

NOTES

- Specify options, if required
- View the graph.

8.3.1 Activating the Graph Command:

If you want to draw a graph, you have to retrieve the worksheet for which graph has to be drawn. For example, you can retrieve the marks worksheet. Type

- Select / Graph

1-2-3 display the graph menu and the graph setting sheet.

Graph Settings and Menu

A1				MENU
Type X A B C D E F Reset View Save Options Name Group Quit				
		Graphs Settings		
Type : Line		Titles : First		
X :		Second		
A :		X axis		
B :		Y axis		
C :			Y Scale:	X Scale:
D :		Scaling	Automatic	Automatic
E :		Lower		
F :		Upper		
Grid: None Color : No		Format	(G)	(G)
		Indicator	Yes	Yes
Legend	Format :	Data tables :	Skip : 1	
A	Both			
B	Both			
C	Both			
D	Both			
E	Both			
F	Both			

The graph setting sheet displays the settings for the current graph. At present, it is almost blank. It will display more details when you select it them with the graph menu.

8.3.2 Specifying the range:

We have to define the numeric data which you want to print in the graph. You can use up to 6 ranges which are numbered A through F. These ranges are called data ranges.

To begin with you will use the A range to plot the marks for the subjects in the mark worksheet. The mark figures are stored in the ranges B4. B7., Move the cell pointer to cell B4 and press • to mark the starting of the range. Use → to move the cell pointer to B7 to highlight the range B4.. B7. Press ↵ to specify the highlighted as the first data range (A range). Additional data values are specified with the data ranges B-F.

The X-axis in the graph does not represent any numeric data. It is divided into a number of points equal to the data values in the specified range. The X-axis can be labeled to make the graph more expressive. Let us display the subject names through the X data range for the marks worksheet graph. Move the cell pointer to cell A4 and select the range A4.A7.

Starting the graph type:

1-2-3 provides five types of graphs viz., Line Graph, Bar Graph, Pie Chart and XY Graph. You can select any type by using the TYPE command in the graph menu.

8.3.3 Specifying Options:

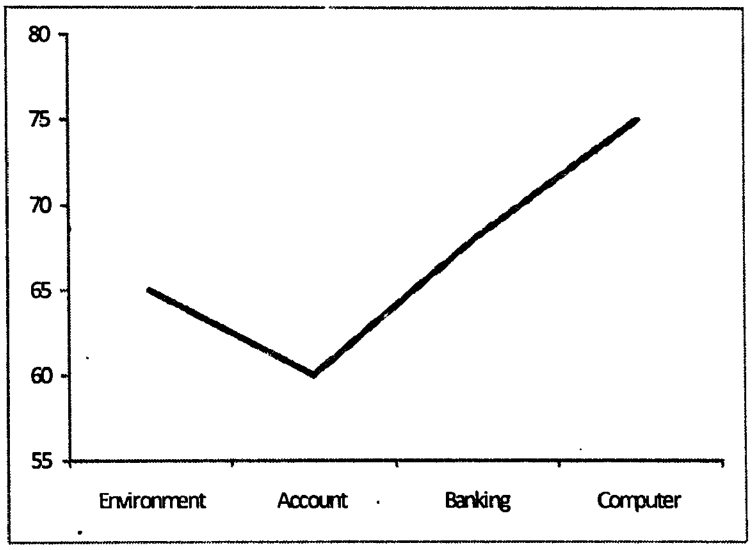
The appearance of the graph can be improved by including options like graph titles, legends, data lablels, grids and so on. A graph also can be in color.

8.3.4 Viewing advertising graph:

You can save advertising graph for i) viewing ii) to print on a printer. A graph saved for viewing cannot be printed. If you want to save the current graph setting for later viewing, save the file with / File Save. Whenever you want to view the graph, you can press the function key F10 or with / Graph view command. The current graph may be saved with all optional settings in a separate graph file. The saved graph file is used to print the graph through the print Graph features.

To display the graph, select VIEW, when the control panel is displaying the Graph menu. Initially LINE is selected. To select other graph types, use arrow keys to highlight the desired graph and press ↵ . The different graph for the marks worksheet are as follows:

LINE GRAPH



NOTES

Check you progress

Fill in the blanks:

1. Worksheets generally contains more ________ data.

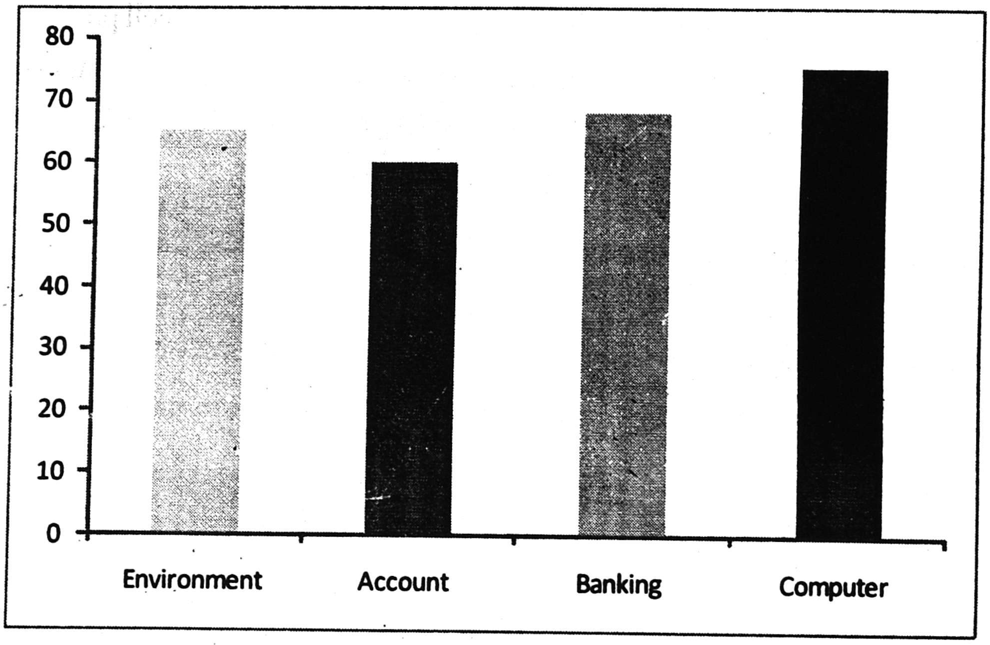
2. Lotus 1-2-3 supports ________ different types of graphs.

3. Ranges are numbered A through ____________

4. Any type of graphs can be selected by using the ____________ command

NOTES

BAR GRAPH

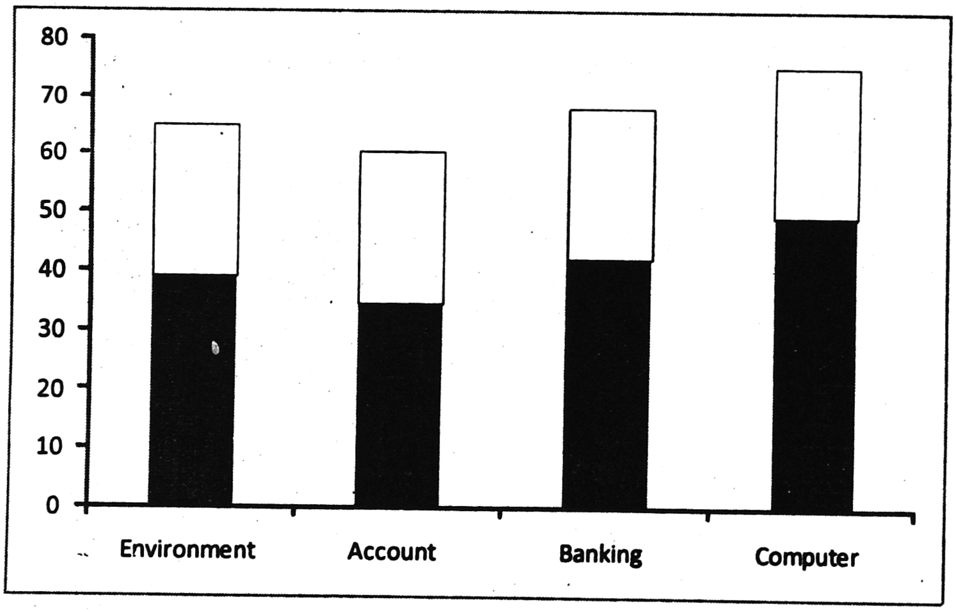


If more than one range is selected then the bars are displayed adjacent to each other in the bar graph.

Stacked-Bar Graph:

Stacked-bar graph are similar to bar graphs. In this graph the bars are stacked one over the other when more than one range is displayed.

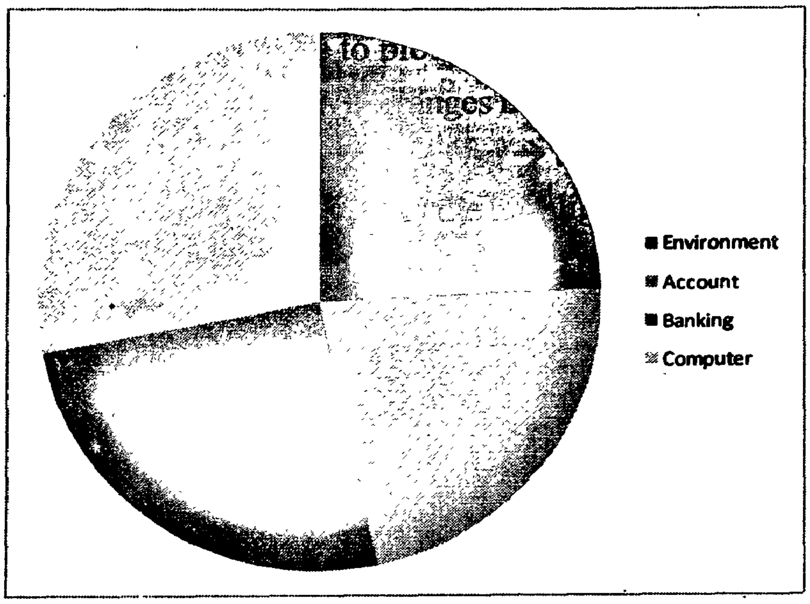
STACKED BAR GRAPH



Pie Chart:

A pie chart presents the data values of advertising range as wedge-shaped sections of a circle. The total value represents 100 per cent. The diagram displays the percentage of each value of the total of all the values in the range. This chart is more suitable to display the financial aspects.

NOTES



XY Graphs

XY graphs are different from other graphs. It is also called as a scatter graph. XY graph plots the correlation between two sets of variables. This type of graph is used to plot advertisement against sales, weight against height or a correlation between sales and profit.

8.4 USING DATE AND TIME

You may want to use data in a work sheet on various occasions – data of creation, date of printing, date of appointment of a worker etc. 1-2-3 supports several functions to enter the date in cells.

Entering the current Date: The function to enter the current date is @ Now

- Erase the current worksheet with / worksheet Erase Yes
- Enter @ Now in cell A1

The computer displays a number rather than the actual date. Each date is represented by a unique number which is equal to the number of days elapsed since January 1, 1900. Generally the date number is not much of use. Therefore you have to format the cell containing the date number to display the date in desired format.

- Invoke the 1-2-3 main menu and select Range Format Date 1-2-3 will display several date formats.

1 (DD-MMM-YY) 2 (DD-MMM) 3 (MMM-YY) 4 (Long Intn'1) 5 (Short Intn'1) Time Lotus Standard long form

- Initially date format 1 is high lighted.
- Press ↵ to select it
- It prompts to enter the range: Enter range to format: A1...A1
- Press ↵.

NOTES

Since the current width (9) is not sufficient to display the date in the selected format 1-2-3 displays asterisks in cell A1. Hence change the column width to 11.

- USE / worksheet column Set-width to change the column width to 11, 1-2-3- displays a date in the DD-MMM-YY format.

Entering Dates in a worksheet: The range to display the dates can be formatted before or after entering dates. A particular date can be entered with @DATE.

- Move the cell pointed to the particular cell
- Use / Range format date
- Press ↵ to select the first date format.
- Select the range.
- @ DATE (year, month, day)

The worksheet now displays the dates in prompt format.

8.5 USING TIME IN WORKSHEET

1-2-3 supports several functions to enter the current or desired time in any cell. The current time can be displayed in a cell with @ Now. To do this, you need to format the cell for time display after entering @ Now. The hour, minute and second can also be extracted from time by using 1-2-3 functions. A desired time can be entered with @ TIME.

- Invoke the 1-2-3 main menu and select Range Format Date
- Select the last option in the main menu-Select Time 1-2-3 displays the following menu.

1 (HH:MM:SS AM/PM) 2 (HH:MM: AM/PM) 3 (Long Intn'1) 4 (Short Intn'1) Lotus Standard long form

- Select 2
- Press ↵ to select the range
- The current time is displayed in the cell.

8.6 NAMING RANGES

Ranges are used for copying, moving and formatting and they are specified either by typing the range address or by pointing. This process of typing or pointing may become cumbersome if you have to use the same range with several commands. In such case, the easier way is to assign a name to the range. This is called "naming ranges". The range name can be used with commands. You can assign names to any number of ranges in a worksheet. The range name is assigned with the / Range name create command.

NOTES

Let us the command on the illustrated PROFIT worksheet.

A1 READY

Worksheet Frame

	A	B	C	D	E	F	G
1		Profit and Loss Statement					
2		APRIL	MAY	JUNE	JULY	AUG	SEP
3	Cost	60,000	65,000	75,000	70,000	60,000	80,000
4							
5	Overheads	10,000	15,000	15,000	20,000	20,000	15,000
6	Sales	1,00,000	1,10,000	1,25,000	1,30,000	1,00,000	1,26,000
7							
8							
9	Profit	30,000	30,000	35,000	40,000	20,000	31,000
10							
11	Total	6,91,000					
12							
13	Total Profit	1,86,000					
14							
15							
16							
17							
18							
19							
20	29-OCTOBER-2003	8.30 AM					

In the given worksheet, the profit figures are entered in range B9..G9 and total profit in B13. Let us assign the name PROFIT to this range and then use it in functions. The steps are:

- Select / Range Name

  Display will be a follows:

Create	Delete	Labels	Reset	Table
Create or modify a range name				

- Select create
- Enter PROFIT (in response to the prompt for the range name)
- Enter B9..G9 (in response to the prompt for the range address)

1-2-3 assigns the range B9.G9 to the range name PROFIT

Now you can use this range name (PROFIT) to calculate total profit.

- Move the cell pointer to cell B13 and enter @ sum (PROFIT)

1-2-3 displays 1,85,000 as the total profit.

You can also create other range names. Let us create for sales.

- Move the cell pointer to cell B7
- Select / Range Name
- Enter SALES
- Enter B7..G7
- Move the cell pointer to Cell B11 and enter @ sum (SALES)

NOTES

1-2-3 displays 6,90,000 as the total/sales

To save the defined range names, select / File save to save the modified PROFIT worksheet.

1-2-3 functions are classified into nine categories viz., statistical, mathematical, Date & Time, financial, Database, logical, string, special and Add-in.

8.7 USING SATISTICAL FUNCTIONS

Statistical functions performs statistical operations on a range of numerical values. 1-2-3 supports the following statistical function.

@AVG	-	calculate the average of a list of values
@COUNT	-	counts the non-blank cells in a list of values
@MAX	-	finds out the maximum value in a list of values
@MIN	-	determines the minimum value in a list of values
@STD	-	calculates the standard deviation in a list of values
@SUM	-	calculate the sum of the value in a list.
@VAR	-	calculate the variables of a list of values.

Check you progress

Say True or False:

6. Stacked-bar graphs are similar to bar graphs.
7. Pie chart is more suitable to display any variable.
8. XY graphs are called as line graphs.
9. @AVG is a mathematical function.

You can also specify multiple ranges with @ SUM functions

Examples:

@ SUM (A1..A4, B1..B4) - Sums up values in ranges A1..A4 and B1..B4

@ SUM (PROFIT, $ SAMPLE) - Sums up values in PROFIT and SAMPLE

Illustration:

Using @ AVG function in the given PROFIT worksheet

- Move the cell pointer to cell A15 and enter Average Profit
- Move the cell pointer to cell B15 and enter @ AVG (PROFIT)

1-2-3 displays 6,100 as the average profit in the cell.

8.8 USING MATHEMATICAL FUNCTIONS

Mathematical functions perform mathematical operations on numeric data.

@ ABS	-	Calculates the absolute value of a number
@ EXP	-	Calculates the number e raised to the specified power.
@ INT	-	Returns the integral portion of a value.
@ LN	-	Calculates the natural logarithm of the value specified
@ LOG	-	Calculates the common logarithm of a value
@ MOD	-	Calculates the modulus (remainder) of two values
@ RAND	-	Returns a random number between 0 and 1 every time the Worksheet is calculated.

NOTES

@ ROUND	-	Rounds off the value to a specified number of decimal places.
@ SORT	-	Calculates the square root of a positive number 1-2-3 also has the following trigonometric functions viz.,

@ACOS, @ASIN, @ATAN, @COS, @PI, @SIN and @TAN.

8.9 USING FINANCIAL FUNCTIONS

Financial functions are used to calculate loans, depreciation, cash flow, present and future value and so on.

@ CTERM	-	Calculates the number of periods takes for an investment to grow to a future value at a given rate of interest.
@ RATE	-	Calculates the periodic rate of interest for an investment to grow to a future value over a specified period.
@ TERM	-	Calculates the number payment periods required to accommodate the investment to a future value.
@ FV	-	Calculates the future value for annuity earning a fixed periodic rate of interest.
@ PMT	-	Calculates the equal periodic payments required to pay off a loan.
@ PV	-	Calculates the present value of annuity to be received in the future
@ NPV	-	Calculates the net present of a series of future cash flows discounted at a fixed interest rate.
@ IRR	-	Calculates the Internal Rate of Return expected from a series of cash flows occurring at regular intervals.

8.10 KEY TERMS

- **Graphic** : A display device that provides the repesntation of data in graphic form
- **Range** : The set of values that a quantity, function or variable can take
- **Statistical functions** : Performs statistical operations on numeric data.

NOTES

8.11 SUMMARY

Graphs convey the message clearly and quickly. Lotus 1-2-3 supports line, bar, staked bar, pie and xy types of graphs. For drawing graphs, one has to activate the graph command and has to specify the range, Before printing the graph you can view the graph. Date and time of creating the worksheet can be made. Ranges can be named and the range name can be used with commands. 1-2-3 supports statistical functions to perform statistical operations. Mathematical functions perform mathematical operations on numeric data. Financial functions are used to calculate loans,depreciation, cash flow and so on.

8.12 ANSWERS TO CHECK YOUR PROGRESS

Check you progress

1. numeric	2. Five	3. F	4. Type	
5. T	6.F	7. F	8. T	9.F

8.13 QUESTIONS/EXERCISES

Section - A

1. Explain how will you generate the line graph in lotus 1-2-3
2. Describe the concept of Naming ranges in Lotus 1-2-3.
3. Write any five financial functions of Lotus 1-2-3

Section - B

4. Write statistical and Mathematical functions in Lotus 1-2-3
5. Explain the procedure for drawing different types of graphs by using imaginary figures.

UNIT – 9 MICROSOFT WORD (MS WORD)

NOTES

Structure

9.1. Introduction
9.2. Objectives
9.3. Starting MS-word
9.4. Document Window
9.5. Editing Document Text
9.6. Formatting Text
9.7. Tables
9.8. Graphics
9.9. Templates
9.10. Wizards
9.11. Key Terms
9.12. Summary
9.13. Answers to check your progress
9.14. Questions/Exercises
9.15. Further Reading

9.0. INTRODUCTION

Window is a powerful operating system. It was a graphical user interface. The command and syntax need not be memorized as in other operating system. Microsoft Office (MS Office) includes Word, Excel, Power Point, Access, Outlook, the Office Shortcut Bar and Office Assistant. In this unit we will mainly discuss about MS Word. MS Word is a software package offering features for sharing data and documents, communication tools, internet access and publishing capabilities. You can create letters, memos, reports with the help of MS Word. It can also help you to send documents to a group of people for feedback.

9.1 UNIT OBJECTIVES

After going through this unit, you will be able to

- Open MS-Word
- Create a new file
- Handle Document Window
- Edit Text
- Formatting Tables
- Insert Pictures
- Handle Templates and Wizards

NOTES

9.3 STARTING MS-WORD

We can start word in the following ways.

a. Click the Short Bars new office document button and double click the blank document icon to create a new document .

b. Click the Shortcut Bars new office document button and open a word template or word wizard.

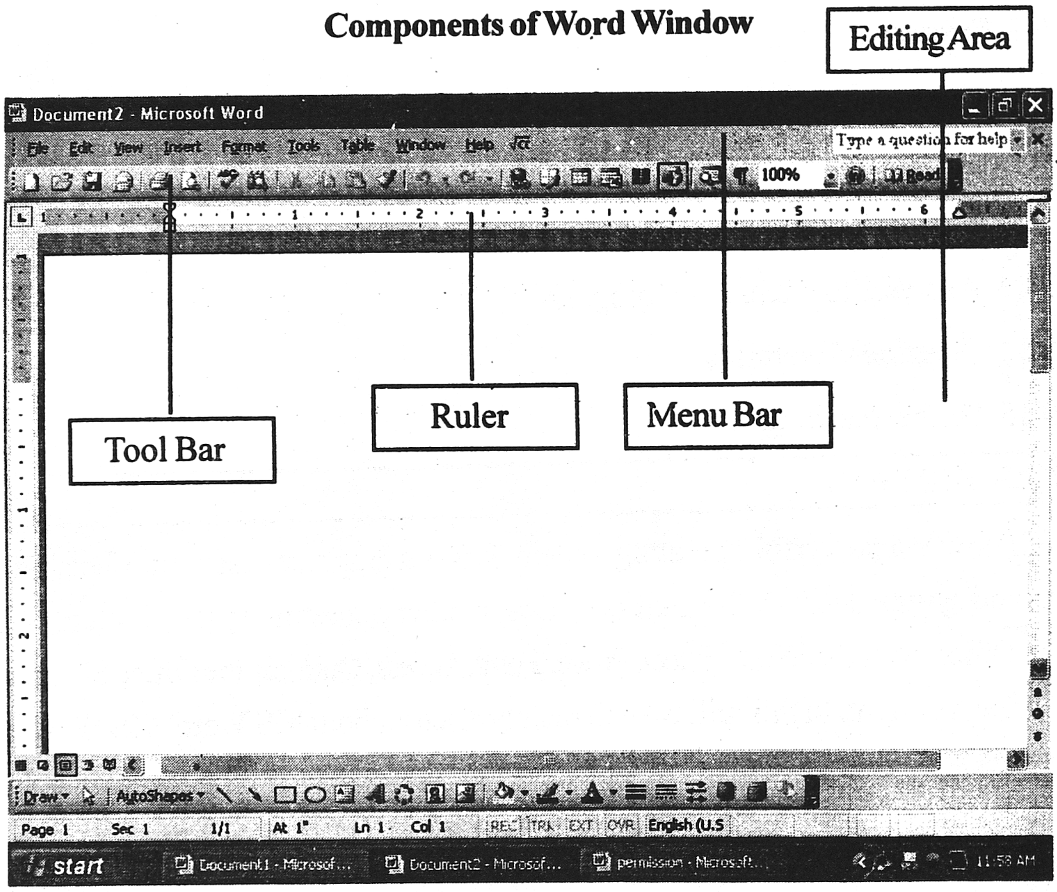
c. Click the Shortcut Bars open office document button and select an existing document you want to edit.

d. Use the widows Start menu by selecting MS Word from the program menu

e. Select word document from the Windows Start Means Document options.

f. Click the Office Shortcut Bars button to create a blank document.

Components of Word Window



9.4 DOCUMENT WINDOW

A new Document window is displayed each time you start word. The document window contains individual word files.

9.4.1 Creating a new file:

Creating a new file is the first step in working with a new document. A new file may be created by clicking on file new or the new blank document button on the standards tool bar, then choosing an appropriate template

NOTES

9.4.2 Typing Text and savings:

Once the new document opened we can enter text in the edit window. To save the file, select file / save or press save buttons. The file will be saved with its current name and file type.

9.4.3 Moving around the document:

For making corrections, one should be able to move to any part of the document. The place for corrections is denated by blinking vertical bar called insertion point. This insertion point, to make correction has to be moved either by mouse or by keyboard operations. The different ways of moving the insertion point (cursor) are

a. To move to the end of the document –

Mouse: move to the end of the document and click

Keyboard: press Ctrl + End Keys

b. To move to the beginning –

Mouse: move to the beginning of the document and click

Keyboard: press Ctrl + Home Keys

c. To move to the middle of the document –

Mouse: move to the desired place and click

Keyboard: press the arrow keys to reach the desired place.

d. To move to the next page –

Mouse: The area between the scroll box and the bottom scroll arrow in the vertical scroll bar can be clicked

Keyboard: press Pg Dn Key

e. To move to the previous page –

Mouse: The scroll box in the scroll bar can be dragged upwards to move to the previous page.

Keyboard: press Pg Up Key

f. To move to any page –

Mouse: Open the Find and Replace box by double clicking the status bar. Click the 'Go To' option move the cursor to the specified space.

Keyboard: press Ctrl + G Keys. Specify the page.

9.4.4 Correcting and Inserting Text:

The word to be corrected should be selected by double clicking it with the mouse. The word will be highlighted. Now type correct word which will replace the original word.

It a sentence to be changed, place the mouse at the beginning of the sentence click once. Hold the left button pressed drag the mouse to the end of the sentence and release

NOTES

the button. Now the whole sentence will be highlighted. Type the new matter and the old one gets erased.

If a word to be deleted, place the cursor of the end of the previous word and press Ctrl + Del . The word and blank space after the word gets erased.

In an existing document, new text can be inserted. For inserting, the mode must be in the 'insert mode'. Move the cursor at the point where text is to be inserted. When we type the new test, the existing text will move to the right to give room for the entry.

A blank line can be inserted by pressing Enter once. Date and time can also be inserted, in the documents such as memos and invoices, by using the Date and Time dialog box.

9.4.5 Printing a document:

- Printer should me made ready. Connect the printer, switch on the printer, place the papers in the printer
- Click the print preview button and make adjustments if necessary
- Choose File Print from the menu bar to open the print dialog box, select a printer, choose the number of copies and specify what should be printer.
- Click OK button to print the document.

9.5 EDITING DOCUMENT TEXT

9.5.1 Selecting Text:

After opening the existing file, cursor has to be placed at the beginning of the text to be selected with the help of the mouse. Although we can drag to select text, word offers a number of other options by which we can select text smoothly. The following table exhibits the different kinds of selecting text.

To select	Do This
A word	Double –click anywhere in the word
A sentence	Hold ctrl and click anywhere in the sentence
A paragraph	Triple click anywhere in the paragraph
Single line	Move the pointer to the left margin. When the printer changes to a right-pointing arrow, point to the desired line and click.
Entire document	Choose Edit select all from the menu bar or hold ctrl and click in he left margin
Multiple lines	Move the printer to the left margin. With the right-pointing arrow, point to the first desired line and click. Without replacing the mouse button, drag to select additional lines.
Multiple words, lines or sentences	Move the I-beam into the first word, hold the mouse button, drag to the last word, and release
Multiple words, lines or sentences using shift-select	Click the first word, move to the last word (with mouse button released) hold shift and click. Everything between the two clicks is selected.

NOTES

9.5.2 Copying and Moving Text:

Moving text deletes the original and placed it in the new location. Copying text leaves the original in place and creates a copy in the new location. Cut, copy and paste are the standard window functions. All the moving and copying techniques work with pictures or any other objects just as they do with text. The steps for moving or copying text are as follows.

- Select the text which you want to move or copy
- Click the cut or copy button on the standard tool bar
- Move the insertion point to where you want the text to appear
- Click the paste button

To move and copy text short distances, it is easy to use a method called drag-and -drop.

Moving text using Drag-and-Drop.

- Identify the text you want to move and its destination
- Selèct the text and drag it to its new location while holding down the right mouse button. Drop the selection into position by releasing the mouse button.
- Select Move Here from the standard menu
- If you split the screen, drag the Resize control to remove the split.

Copying text using Drag-and-Drop-

- Identify the text you want to copy and its destination
- Selecting the text and drag it to new location while holding down to the right mouse button. Drop the text into position.
- Select Copy Here from the shortcut menu

9.5.3 Using the Undo feature:

While editing word documents, if a wrong action is taken, it can be taken back with the help of undo feature. Undo feature can be used for all actions like formatting, deleting, inserting, pasting, cutting and so on. But by clicking the undo button once, only the action which is done just before the clicking of undo button with be reversed. To reverse a number of actions performed, say three, undo button should be pressed three times.

9.5.4 Using the Rado feature:

Redo feature repeats the action that is taken on the document. It is useful when a number of actions is to be repeated. One action will be repeated by one press. If a number of actions are to be repeated the button is to be pressed for such a number of items. This redo feature can be used only for the actions which are reversed by undo option.

NOTES

9.5.5 Spell and Grammar checker:

Word has a spelling checker program which can be used to check the document for missplet words. The grammer checker is used to check the documents for problems with grammer. The spelling and grammer dialog box gives us all the options. When we type the text, word will flag misspelled words by placing a wavy red line underneath possible misspelling. Do right click on a flagged word to open the spell. It pop-up menu, which lists suggestions for the proper spelling. Click on the correct spelling, choose to Ignore the word.

9.6 FORMATTING TEXT

Formatting refers to the changes made to improve the appearance of the Documents. Use of different margins, line spacing, page numbers, headers and footers make a document easier to read and also provide important information for the reader. World has standard format settings. When new document are created, they are arranged as per these default settings. These default settings can be changed as required.

CHECK YOU PROGRESS

Fill in the blanks

1. Microsoft word is a part of ....

2. Drag and drop method is easy to move and copy text for a .... distance .

3. Redo feature .... the action that is taken on the document

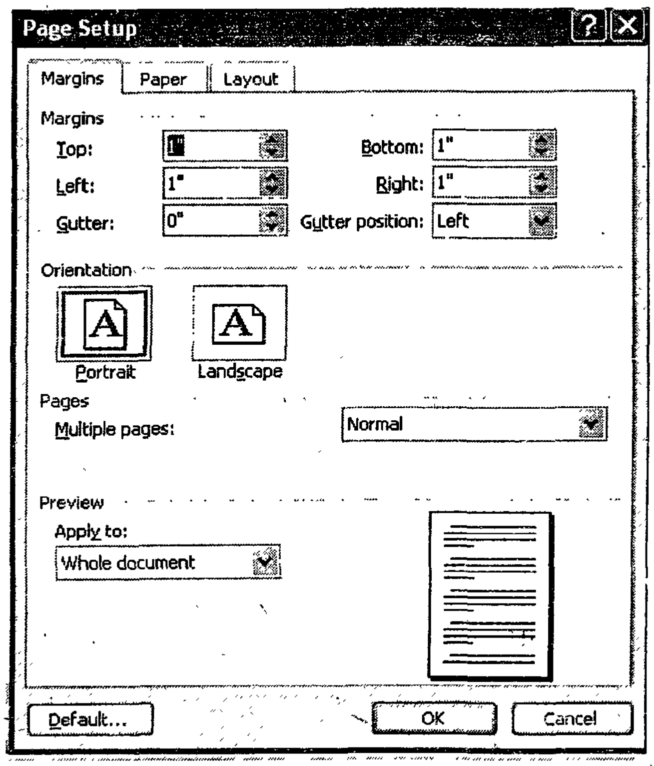
Say true or false

4. We an enter text in the edit widow

5. Spelling checker program is also used to check the documents for problems with grammer

9.6.1 Setting Margins:

Word's default margins are 1 incs on the top and bottom and 1.25 inches on the left and right sides top and bottom and 1.25 inches on t he left and right sides of the page. To change margins, use the Margin page of the page setup dialog box and set the option.



Top, Bottom, Left and Right spin box controls set the amount of white space on the four edges of the document.

- The gutter margin is used to additional space to a document that will be bound.
- The mirror margin feature helps format margins for back-to-back printing.

Changing of document margins can be made as follows-

NOTES

- Position the insertion point where you want the margin changes to take effect.
- Choose file Page Setup to open the Page Setup dialog box and click the Margins tab
- Click the Mirror margins check box to activate mirror margins, if desired.
- Use the spin box arrows or type the text boxes to increase or decrease the margins.
- Click OK to return to the document.

9.6.2 Setting Line Spacing:

Line spacing is the vertical distance between lines of text. Word provides six options for adjusting line spacing.

Single	Enough space to display the largest character on a line
1.5 lines	One-and-a-half single lines
Double	Twice space as single spacing
At Least	A minimum line spacing for the selection
Exactly	Makes all lines eventually spaced regardless of the size of the fonts or graphics included in those line
Multiple	Used to enter line spacing other than single, 1.5 and double.

Procedure:

- Select the text whose line spacing you want to change
- Choose Format Paragraph to open the Paragraph dialog box
- Click the line spacing drop-down list to select the desired line spacing
- If you choose At Least, Exactly or Multiple, enter a number in the At control
- Click OK to return to the document and revises the changes.

9.6.3 Aligning Text:

Word provides four options for aligning paragraph text viz left, center, right and full (justify). To align text, position the insertion point anywhere in the paragraph and click one of the alignment buttons on the formatting toolbar.

9.6.4 Intenting Text:

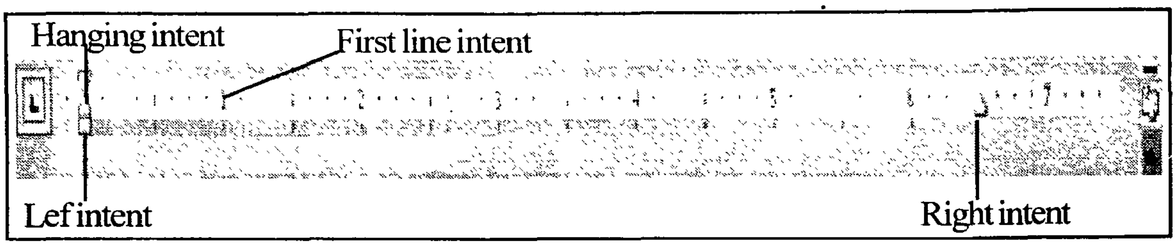
Intenting is nothing but moving in. Word offers three ways to access the paragraph-intenting features viz., the formatting tool bar, the ruler and the Paragraph dialog box.

i. Formatting tool bar is the easiest method to change intents. Click anywhere in the paragraph, and click the Decrease Intend button to reduce the left intent by ½ inch. Click the Increase Intent button to extent by intent by ½ inch.

ii. Creating intents using the ruler is a visual way to set left, rights, handing and dual intents. There are four intents markers as shown in the following diagram.

NOTES

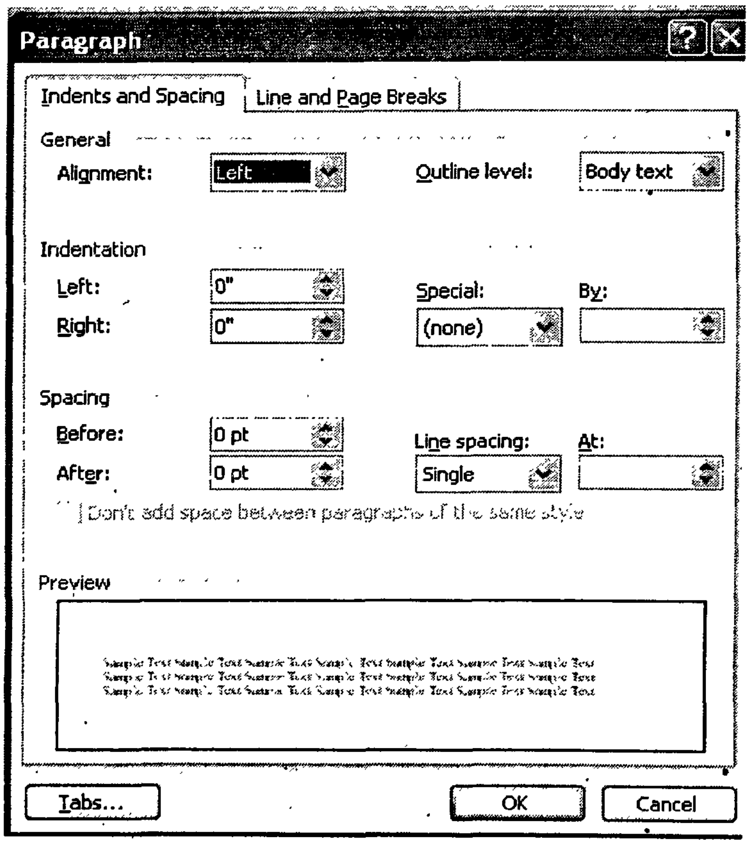
Intent markers on the ruler



Steps for intenting using the Toolbar and Ruler-

- Click in the paragraph to intent and click the Increase Intent button or Decrease Intent button on the Formatting tool bar
- Chose View Ruler
- Select the text to intent
- Drag the First Line Intent marker to the right to intent the first line in a paragraph
- Drag the Hangling Intent marker to the right to intent all but the first line in a paragraph
- Drag the left Intent marker to intent all the selected text.
- Drag the Right Intent marker to intent the selected text from the right margin.

iii. Indenting using the Paragraph Dialog box is the third way to set intents. To access the Dialog box, choose Format Paragraph or right-click and choose paragraph from the short cut menu.



The steps for intenting is as follows-

- Select the text to indent and open the paragraph dialog box.
- Use the spin box controls to charge the Left and Right intent settings.
- Click and Special drop-down arrow to select First line or Hanging intent.
- Click OK to close the paragraph dialog box

9.6.5 Fonts and Font styles:

You can give a professional appearance for the documents by using Windows applications. The right combination of fonts, font styles, sizes and attributes can make the documents more attractive.

To change the font, click the drop-down arrow next to the font name. To turn on Bold, Italics or Underline, click the corresponding button on the tool bar. The selected text will be changed to that font. Font color is available from most tool bars as well as from the Font dialog box. Some new decorate fonts are shown below.

Some new decorative fonts shown in Word

This is Blackadder ITC.

THIS IS CASTELLAR

This is Jokerman.

This is Lucida calligraphy.

This is Rervie.

9.6.6 Creating and Modifying Page numbers:

Page numbers offer a convenience for the writer as well as for the reader The steps involved are-

- Place the cursor at the beginning of the document
- Page numbers option of the Insert menu is selected
- The page numbers dialog box appears in the screen
- You have four options regarding page numbers

i. Position – Bottom of the page or Top of the Page

ii. Alignment – Left, Center, Right, Inside or Outside

iii. Show numbers on First Page

iv. Format – Open the Page Number Format dialog box. It allows you to choose a numbering style such as "A, B, C" or "1,2,3" and to include a chapter number, if you desire.

NOTES

- After making the formulating choice, click OK to return to Page Number dialog box
- Once again click OK to insert the page number
- To view the page numbers, switch to Print Layout

9.6.7 Handling Page Break:

Word offers an option with the tacky name window/orphan control. This feature prevents the first line of a paragraph from being left alone at the bottom of the page (an orphan) or the last line of a paragraph from appearing by itself at the top of a new page (a window). You can turn window/orpharn control off in the Line and Page Breaks tab of the Paragraph dialog box (choose Format > Paragraph > Line and Page Break). The steps for adjusting line page breaks are –

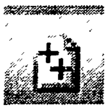
- Choose Format > Paragraph > Line and Page Breaks to turn text few option – widow/orphan Control, Keep Lines Together, Keep with Next, and Page Break Before on or off.
- Press Ctrl + shift +hyphen to insert a non-breaking hyphen.
- Press Ctrl + hyphen to insert on optional hyphen
- Press Ctrl + shift + spacebar to insert a non-breaking space.

9.6.8 Creating Header and Footer:

In addition to the page numbers you may want to include other informations – name of the organization, all right reserved, etc – on each page. For this type of informations, you can use Header and Footer features. Header is the text that is normally printed at the top of the page. Footer is the text appears at the bottom of the every page.

To insert a header or Footer, choose View>Header and Footer. The existing document text will immediately dimmed and the Header text box at the top of the document will open. Enter the text in the Header text box. Use the Toolbar buttons to create and modify the headers and Footers.

Header and Footer tool bar buttons

Button	Button Name	What It Does
	Insert Auto Text	Provides drop-down list of Auto Text entries.
	Insert Page Number	Inserts page number placeholder
	Inssert Number of Pages	Inserts placeholder for total number of pages

NOTES

	Format Page Number	Opens Page Number Format dialog box.
	Insert Date	Inserts placeholder for date
	Insert Time	Inserts placeholder for time
	Page Setup	Opens the Layout page of Page Setup dialog box
	Show/Hide Document Text	Makes document text visible or invisible while working with background
	Same as Previous	Makes header or footer the same as in the previous section
	Switch between Header and Footer	Changes view between header and footer text box
	Show Previous	Moves to previous section's header
	Show Next	Moves to next section's header
	Close Header and Footer	Closes Header and Footer view

Process for creating headers –

The process for creating headers, footers or both is the same.

- Move to the header or footer which you want to add or edit.
- Use the Switch between Header and Footer and show Preview/show Next buttons to navigate between the header and footer in each section of the document.

9.7 TABLES

Tables are one of the most versatile tool in the word. With tables, every block of text can be easily formatted, edited, deleted and moved around without affecting the remainder of the text.

NOTES

Tables can be created in 3 ways viz.,

i. Using the Insert Table button

ii. Using the Insert Table dialog box and

iii. Using the Draw Table button

To use the Insert Table button, click the button and drag the number of rows and columns you want in your table. When you release the mouse button a bank table appears. To create a table using the Insert Table dialog box, choose Table > Insert Table. Enter the number of rows, columns, and column widths in the appropriate controls and click OK to create the table. To draw a table, of your options, click the tables and Borders button on the Standard toolbar. The mouse pointer will change to a pencil. Drag the lines about the size of a table which you require. When you release the mouse button, the table is created.

9.7.1 Entering and Editing Text

After creating the table, text has to be entered. Enter the text by clicking in any cell. Arrow keys are used to move from one cell to another. The procedures for entering, editing and positioning text in tables are

- Click in any cell and begin typing. Use the Tab key to move one cell to the right, shift Tab to move to the left and arrow keys to move up and down or left and right.
- Apply any character or paragraph formatting options to the text. Each cell is treated as a paragraph
- Click one of the alignment buttons on the Tables and Borders toolbar in reposition text within a cell
- Click the change Text Direction button on the Table and Borders toolbar to rotate text vertically.

9.7.2 Modifying Table Structures:

Modification of the table is an easy job in word. You can add or delete rows and columns, change column and row widths and merge and split cells without upsetting the rest of the table text. The procedures for modifications are-

- Insert rows at the end of the table by clicking in the last cell and pressing Tab. Insert rows in the middle of the table by selecting the number of rows to insert and choosing Table > Inset> Rows Above or Table > Insert > Rows below.
- Delete rows by selecting the rows to delete and Choosing Table > Delete > Rows.
- Insert columns by selecting the number of columns to insert and selecting Table > Insert > Columns to the left or Table > Insert > Columns to the right.
- Change the width of the column by pointing to the cell border and dragging the border with the double headed arrow pointer.

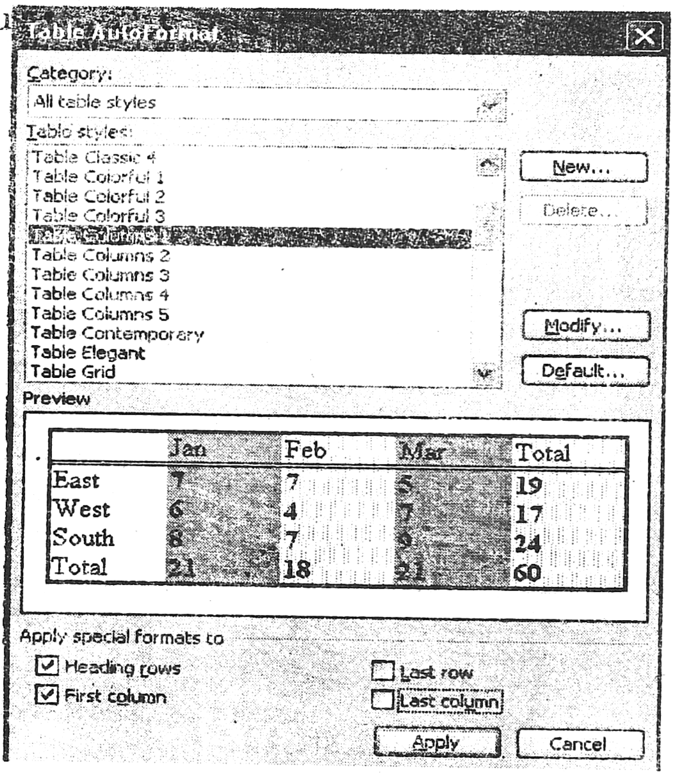
- Merge cells by selecting the cells to merge and choosing Table > Merge cells or by clicking Merge cell buttons.

9.7.3 Formatting Tables:

Word offers both automatics and manual table formatting options to add and remove borders, change borders types and add colors and shading.

Auto Format provides with a number of formats that can apply in one easy step. Click anywhere in the table and choose Table > Table Auto Format to open the Table Auto Format dialog box.

Auto Format applies borders, shading, fonts and colors. Turn check marks on or off to indicate the options to apply. Choosing any of the format will give a preview of the format. We can adjust Auto Format manually or start from scratch it you do not prefer the Auto Format by tu



NOTES

Check Your Progress

Fill the Blanks

6. Words' default margin on the top is .... inch.

7. Word provides .... option for aligning paragraph text

8. Tables are created in .... ways

Say True or False

9. Line spacing is the vertical distance between lines of text.

10. Page numbers can be made only at the top of the text.

9.8 GRAPHICS

You can insert graphics, sound and video in every office application. The MS Clip Gallery had a broad selection of media chips. To insert clips from the clip Gallery –

- Position the insertion point where you want to insert the clip.
- Choose Inset>Picture > Clip Art to open the Clip Gallery
- Click the file type tab. With video and sound clips, click the play button to preview the file.
- Double – click the sound, video, clipart, or picture to add it to the document.

The logo of a company or any other clipart which you want to use in word can be done by using the import clips feature in the Clip Gallery window to store them in a place.

NOTES

9.8.1 Modifying Pictures:

After placing a picture from a file, you can adjust the picture using the Picture tool bar. Right click the picture and choose Show Picture Tool bar from the shortcut menu. The Picture Toolbar has the following buttons.

Picture Toolbar Buttons.

Button	Name	Use
	Insert Picture from File	Insert another picture
	Image Control	Choose from Automatic, Grayscale, Black & White, or Watermark
	More Contrast	Increase color intensity
	Less Contrast	Decrease color intensity
	More Brightness	Add White to lighten the colors
	Less Brightness	Add black to darken the colors
	Crop	Trim sides of the image
	Line Style	Format the border that surrounds the picture
	Recolor Object	Change individual colors in the object; only avilable in Power Point (see Skilll 7)
	Format Picture	One-stop shopping for picture properties
	Set Transparent Color	Use like an eyedropper to make areas of the picture transparent (used extensively for Web graphics)
	Reset Picture	Return the picture to its original format.

The Crop, Recolor object and set Transport color buttons are used with areas of the picture. All other buttons affect the entire picture.

9.9 TEMPLATES

A template is a collection of document formatting options and content that is available when you create a new document. Every document is based on a template when you

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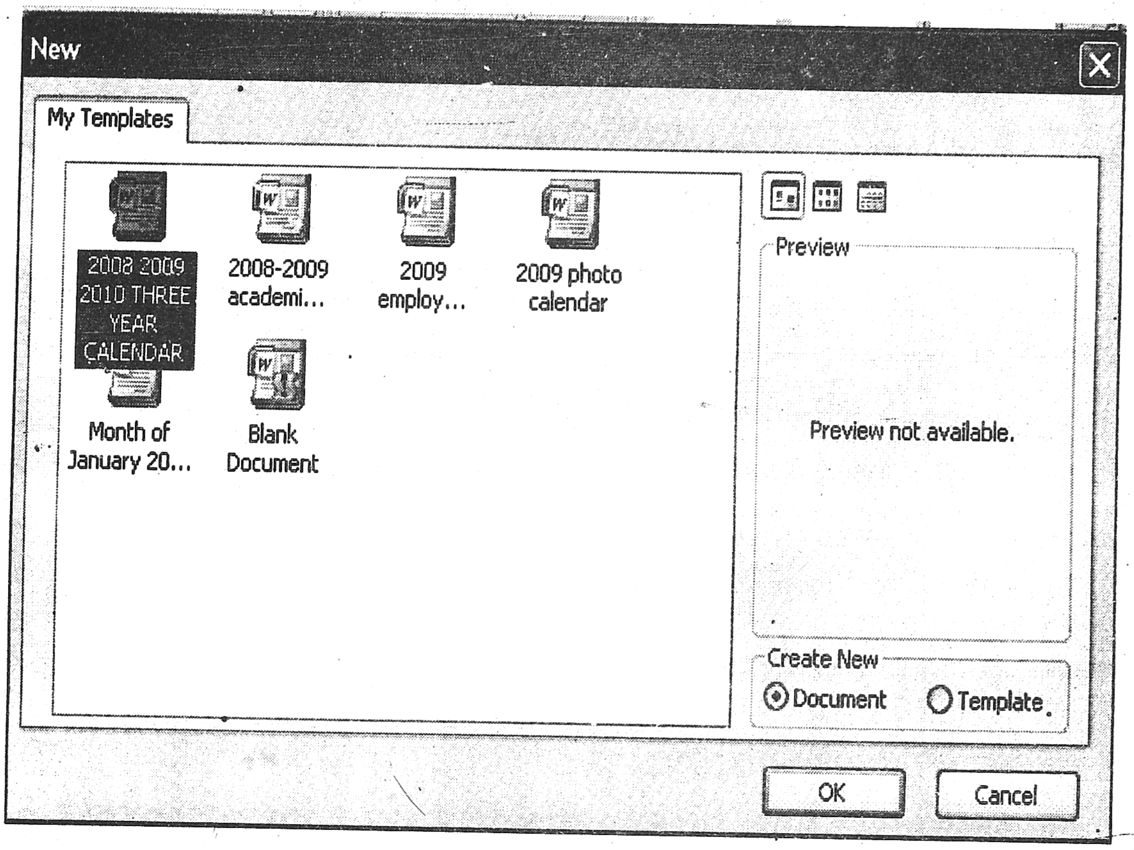
choose File > New from within word, you are presented with a choice of templates. The picture below shows the Letters and Faxes page of the New dialog box within word.



The available templates list depends on how word was installed and whether any new template have been created on the computer. When you save a document created from a template, you must give it a name just like any other new document.

9.10WIZARD

The letter wizard in word can help us to write letter quickly and easily. The wizard provides frequently used letter elements – such as salutations and closings – that you can select from lists. Wizard also helps us closings – that you can select from lists. Wizard also help us to structure the letters based on frequently used letter styles. If you do not have the Office Assistant installed, you can start the letter wizard by clicking New on the File Menu, clicking the letters and Faxes tab and then double-clicking letter wizard. To use the letter wizard to modify or complete on existing letter, open the letter in word and then click letter wizard on the Tools menu.

9.11 KEY TERM

- Test Editing- The process of manipulating text, such as adding, deleting and changing text in a document file.
- Text File- A fie consisting of data in textual form
- Copying - To read data from a source, leaving the source data unchanged and to write the same data elsewhere.
- Moving - An operation that transfers data from one location to another

NOTES

- Undo - A function that allows a user to cancel a previews command and return to the state before the command was executed.
- Redo – A function that repeats the action that is taken place on the document.
- Margin – The space that lies between the text area and the edge of the page or screen
- Alignment – The process of adjusting components of a system for proper inter relationship.
- Font – A family of characters of a given size and style.
- Header – A block of text printed consistently at the top of the pages in a document
- Footer – A block of text printed consistently at the bottom of the pages in a document.
- Page break – A place where a page ends and a new page begins
- Template – A collection of document formatting options
- Wizard – words which are frequently wed letter elements.

9.12 SUMMARY

Microsoft Office (MS Office) is a software package that offers new features, for sharing data and documents. It includes Word, Excel, Access, Power Point, Out look. The basic components of the default word screen are Title bar, Menu bar, Ruler bar, Status bar, Work space, Task bar, View buttons and Insertion point.

A new file is created by clicking on file new. Once the new document is opened, you can enter text in the edit window. For making correction one should be able to move to any part of the document, copying, moving, Undo, feature, Redo feature spell and grammer check are used to edit the document. Formatting a document includes setting margins, setting line spacing, aligning text, intenting text, assigning fonts and font sizes. Headers and Footers are placed to put respective infromation in a document's top and bottom margins. The page numbers are placed in a frame in the header or footer. Tables are made up of rows and columns of data entered into cells. You can insert graphics, sound and video in every office application. Template and Wizard are useful to create the documents. quickly and easily.

9.13 ANSWER TO CHECK YOUR PROGRESS

1) Microsoft office	2) short	3) repeats	4) T	5) F
6) one	7) four	8) three	9) T	10) f

NOTES

9.14 QUESTIONS / EXERCISES

Section – A

1. Explain the method of selecting, moving and copying text in word
2. Discuss the margin setting concept in word
3. Explain the different kinds of selecting text with examples
4. What are the uses of Redo and Undo features?

Section - B

5. Explain the concept of modifying Table structures in word with your own example.
6. Explain the paragraph formatting features in word with examples.
7. Explain the formatting of text in word

9.15 FURTHER READING

1. MS Office for every one – sexena – Vikas publications, New Delhi
2. Microsoft office 2007 – LP Editorial Board – Low Point, Kolkata – 01
3. MS Office – C Nellai Kannan – Nels Publication, Tirunelveli.

NOTES

UNIT -10 EXCEL

Structure

10.1 Introduction

10.2 Unit objectives

10.3 Excel Basic

10.4 Rearranging work sheets

10.5 Excel Formatting

10.6 Key Terms

10.7 Summary

10.8 Answers to check your progress

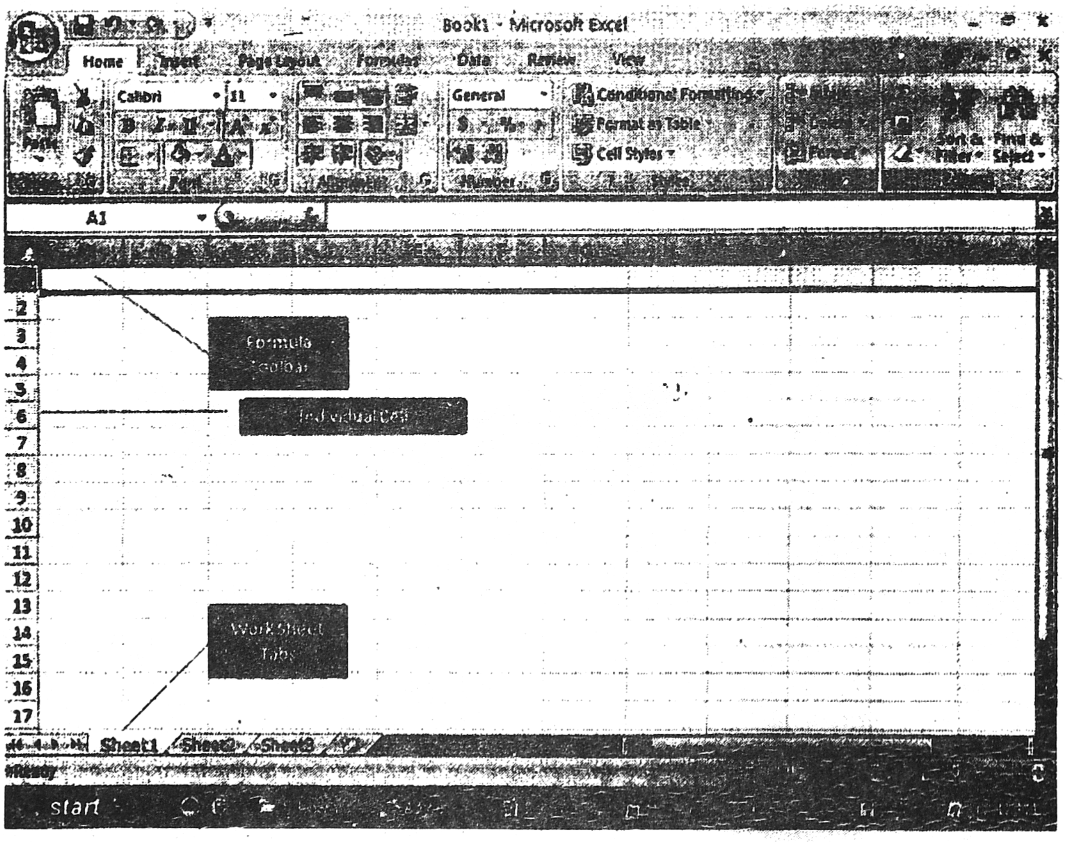
10.9 Questions/Excercises

10.1 INTRODUCTION

Microsoft Excel is an electronic spreadsheet. A spread sheet is a generic term for the software package that simultes a paper worksheet often used by people in management. When you start Excel, work book is displayed. It is here that Excel stores all its data and allows manipulation.

Microsoft Excel is a program designed to enter organized data to analyze and present the results. The Excel application window includes the standard title bar and command bars. Below the command bars is a strip that contains the name box and the formula bar.

Excel Application Window



10.2 UNIT OBJECTIVES

After going through this unit, you will be able to

- Understand the features of Excel
- Navigate worksheet
- Make different types of entries in a worksheet
- Format the worksheets

10.3 EXCEL BASIC

10.3.1 Opening Workbook:

The application window opens with a new Excel workbook. A workbook is a multi-page Excel document. Each page in a workbook is called a worksheet. The active worksheet is displayed in the document window. Worksheet is divided into columns, rows and cells. Each worksheet has 256 columns and 65536 rows. A cell is the interaction of a row and column. Each cell has a unique address composed of the cell's column and row. The active cell has a box around it called the cell pointer. The cell pointer can be moved from one cell to the other by using the arrow keys.

10.3.2 Selecting worksheet items:

Worksheet items viz., cells, rows and columns have to be selected for entering data, making corrections, and changing the width of column or row.

- A cell is selected by clicking the cell. The cell border is highlighted. Cell address appears in the name box of the formula bar. Cell content appears in the contents area of the formula bar.
- Range is the group of adjacent cells. To select the range, place the pointer at the first cell and by pressing and holding down the left button, the mouse is dragged to the lost cell of the range and the button is releaed.
- A column or a row can be selected by clicking the column heading or row heading in the worksheet frame.
- The entire worksheet can be selected by clicking the select All button.

10.3.3 Entering Text and Numbers:

You can enter three types of data in a worksheet viz., numbers, formula and text. Numbers are values used in calculations, including dates. Formulas are calculations. Text is an entry which is not a number or a formula. To enter the data in the cell, first activate the cell and type the data. As soon as you begin entering data from the keyboard, three things happen - an insertion point appears in the cell, the entering text appears in the cell and the formula buttons are activated. Excel has an Auto complete feature that keeps track of text entered in a column and can complete other entries in the same column.

NOTES

10.3.4 Revising Text and Numbers:

You can change an entry in a cell in two ways. Activate the cell and type the new entry, the old entry will be replaced. To delete the contents of a cell completely, activate the cell and then press the Delete key on the keyboard or right click and choose clear contents from the shortcut menu.

10.3.5 Working with Numbers:

Excel was standard computer operator symbols for mathematical and logical. They are.

Operation	Operator symbol
Addition	+
Subtraction	-
Multiplication	*
Division	/
Exponentiation	^
Precedence	enclose in ()
(Do this operation first)	
Equal to	=
Not Equal to	<>
Greater than	>
Less than	<

Check Your Progress
Fill in the blanks
1. A group of cells on which an opeation is to be performed is known as ______
2. You can enter ______ types of data in a worksheet
3. Filling is a kind of ______

Say True or False
4. Microsoft Excel is an electronic spreadsheet.
5. Cell is an area at the intersection of a row and column

10.3.6 Creating Formulas:

You can create formulas in number of ways. Simple formulas are created in two ways. viz a point-and-click method, and worksheet approach method. In a point-and-click method formulas are entered as follows.

- Activate the cell where the result to appear
- Type =
- Click on the first cell where you want to include in the formula
- Type an operator
- Click on the next cell in the formula
- Repeat the previous two steps until the entire formula is entered.
- Finish the entry by pressing Enter or clicking the Enter between on the formula bar.

In the spreadsheet approach method, type the formula using the cell addresses of each cell you want to include in the formula.

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10.3.7 Filling Formulas:

Filling is a kind of copying. The formula may be the same for many calculations. For example the formula for each employees pay is the same, hours *pay rate. Since you have already created one working formula, you can fill it to the other cells.

- Select the cell that contains the formula you want to copy to other cells.
- Drag the fill handle to select the cells where you want the formula copied.
- Release the fill handle to fill the formula.

10.3.8 Totaling Columns and Rows:

Excel has the Auto Sum button on the standard toolbar for creating row and column totals.

- Select the cells that contain the numbers you want to total and a blank row and /or column to hold the totals.
- Click the Auto Sum button on the standard tool bar.

If you want to have a blank row/column before the total, select two blank cells. Excel always places the total in the last empty cell selected.

Formatting Numbers:

Formatting is used to identify numbers as currently or percentages and to make numbers easier to read by aligning decimal points in a column. You can format selected cells using the Formatting tool bar, the Format cells dialog box, or the Shortcut menu.

The formatting tool bar is the toolbar displayed on the right side of the Personal Tool bar. Formatting affects only the display of a cell, not the cell's contents. Using the Formatting toolbar has the following procedures.

- select the cells to be formatted.
- Click a button on the Formatting toolbar to apply a format to the selected cells.
- Click on any cell to turn off the selection.

Format cells dialog box has more number of formulas. After selecting the cells to be formatted open the dialog box either by choose Format > Cells from the menu bar or right click to open the shortcut menu and choose Format Cells.

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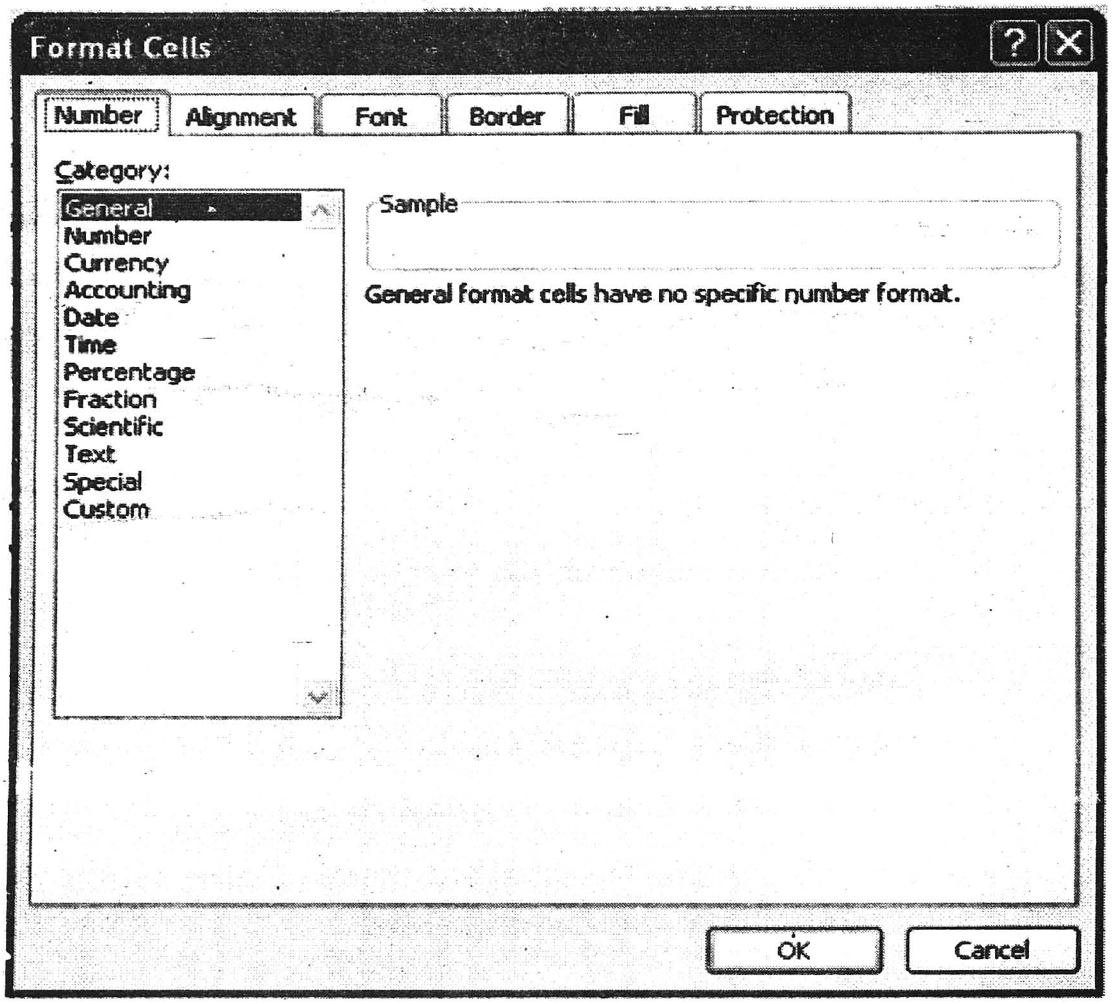
Format Cells Dialog Box



The Format Cells dialog box has separate pages for Number, Alignment, Font, Border, Patterns and Protection. The number page has the following aspects.

Category	Description
General	The default Format
Number	Like General, but you can set decimal places, Use a thousand separator and include negative numbers.
Currency	Numbers are preceded with a dollar sign.
Accounting	Dollar signs and decimal points line up.
Percentage	The same as the Percent toolbar button
Scientific	Numbers are displayed in scientific notation.

Procedure for using the Format Cells dialog box

- Select the cells to be formulated
- Choose Format > Cells, or right click and choose format cells.
- Click the Number tab.
- From the category list, choose the appropriate formatting category

Set the available options, such as the color of text and the background of cells.

Click the OK button to apply the format and close the dialog box.

10.4 REARRANGING WORKSHEET

Changes or adjustments in the layout has to make the worksheet attractive. Adjustments have to be made in inserting or deleting the rows, columns and cells. Naming a worksheet is essential. These will give way for useful presentation.

10.4.1 Adjusting Column width and Row height:

Excel column are slightly more than eight character wide. If the data which are to be entered in the worksheet is wider or much narrower than the existing column, you have to adjust the column. You can adjust column width manually or use AutoFit column width to the existing data. You can adjust the row height in the same way of adjusting column width. The procedure is.

- select the column to adjust
- Position the mouse pointer at the right edge of selected column heading
- Double click
- Click anywhere in the worksheet to turn off the selection.
- To adjust column width manually, drag the right border of a column's heading to make the column wider or narrower.

10.4.2 Inserting and Deleting Rows and Columns

When you require columns in between the current columns you have to insert them and when you have empty columns or unwanted columns, they have to be deleted.

- Select the row or column where the new inserted column to appear
- Right click and choose insert to insert a row. To insert a column from the menu bar Choose Insert > columns.
- To delete a column or row, first select it. Then right click and choose Delete or Choose Edit > Delete from the menu bar.

10.4.3 Inserting and deleting cells:

Sometimes you have to add or delete cells in part of a worksheet without inserting or deleting entire rows and columns. Select the range where new cells to be inserted and then right-click and choose Insert. Open the Insert or Delete dialog box. If you choose shift Cells Down, the cells in a selection and all Cells below them in the same column are shifted. If you choose shift Cells Right, Cells in the same row (sentence) are moved to the right.

NOTES

10.4.4 Moving and Copying Cell contents

If you want to move or copy data from one worksheet to another, cut or copy the selection and then click the sheet tab for the sheet you want to past into. Click in the appropriate cell and then press Enter to paste. For moving and copying cell contents from one worksheet to another, both workbooks must be opened. This process also could be done with Drag-and-Drop method.

10.4.5 Naming a Worksheet:

A work book is a multi-page document. Each page in a work book is called a worksheet. It is practically difficult to remember which sheet contains what data. Excel allows you to give a descriptive name to each worksheet to enable you to locate it instantly within the work book. For naming a worksheet.

- Double-click the sheet tab to select it
- Type a new name for the worksheet
- Press Enter

10.4.6 Selecting Worksheet:

You can move, copy, delete and enter data in selected worksheets, When more than one worksheet is selected, the worksheets are grouped. Data entered into one sheet is entered into all sheets in the group. When entries are finished, immediately you have to ungroup worksheet to avoid overwriting. The procedure is.

- To select one worksheet, click the select tab
- To select more than one worksheet, hold the ctrl key while selecting each worksheet
- To select all worksheet in a workbook, right click on any tab and close Select All Sheet from the short-cut menu
- To ungroup worksheets, right click on any grouped worksheet tab and choose Ungroup Sheet from the short-cut menu.

10.5 EXCEL FORMATTING

You can enhance the appearance of the worksheet by using some other formatting options.

10.5.1 Aligning Text

By default, Excel left-aligns text and right-aligns numbers. You can override the default by using the buttons on the Formatting tool bar and align text and numbers at the left, center or right within cells. By clicking the Alignment page table you can choose horizontal alignment, vertical alignment, rotating text, merge and wrap options.

10.5.2 Borders and Color:

Borders and colors highlight the information in the worksheet. Fill color is used to highlight the background of part of worksheet and font color is applied to text. The Borders, Fill color and Font color buttons are available on the Formatting tool bar.

NOTES

10.5.3 Printing:

Before printing, you have to setup the margins, page, headers, and footers, sheet and see print preview to know how each page of the worksheet will appear when it is printed. Page setup dialog box is used for this purpose.

10.5.4 Page Settings:

- Open the Page set up dialog box
- Change setting for orientation, scaling, Paper size, Print Quality
- Click OK to apply the settings.

10.5.5 Header and Footers:

A header appears at the top each page and footers are printed at the bottom of the page. The default setting has no header or footer. You have to create them.

- Choose File>Page setup from the menu bar
- Select the Header/Footer page.
- Click the Header drop-down list and select a header or click custom Header. Click the Footer drop-down and select a footer or click Custom Footer.
- Press Enter to return to the Page Setup dialog box.

Check Your Progress
Fill in the blanks
6. Each page in a work book is called a ________
7. When worksheets are grouped, data entered in one sheet will be entered into ________ in the group.
8. By default Excel aligns text in the ________
Say True or False:
9. Formatting tool bar is displayed on the right side of the personal tool bar.
10. Active cell is the area where data cannot be entered.

10.5.6 Margins settings:

The preview in the Margin page of the page setup dialog box displays the margins as dotted lines. The margins can be changed by using the spin box controls.

10.5.7 Sheet settings:

The sheet page contains settings that relate to the sheet features that will appear in the printed copy After choosing File > Page setup, specify ranges for a Print Area and rows and columns to be repeated as titles on each printed page by entering them from the keyboard or by using mouse.

10.5.8 Page Break Preview:

Page Break Preview is a view of the worksheet window that shows as what will be printed and the order in which the pages will be printed. You can change the range to be printed by dragging the edge of the page break with the mouse to extent or limit the range of cells to be printed.

NOTES

10.5.9 Print Settings:

To choose a printer to specify what to print and to set the number of copies you have to open the Print dialog box.

- Choose File > Print to open the Print dialog printer from the printer box
- Select a printer from the printer Name drop-down control
- Select what to print
- Setup the number of copies using the copies Spin box
- Specify a page rang
- Click OK to print.

10.6 KEY TERMS

- Spread Sheet - A programme that displays a worksheet in which table consisting of rows and columns.
- Cell - An area at the intersection of a row and column in a spreadsheet.
- Range - A group of cells on which an operation is to be performed.
- Operating Mode- Indicates for operation currently being performed.

10.7 SUMMARY

Spreadsheet is a software which simulates a paper worksheet. MS Excel is a window-based spreadsheet package. Movement in the worksheet is possible by using the keyboard, mouse or the scroll bars. Data entry can be of text, numbers, data and time. Saving a workbook saves all the worksheets contained in it. Making modification in worksheet is possible. It can be done by editing a cell or a cell range. Copying and moving data from one place to another in a worksheet can be done. Worksheet can be inserted and renamed, and deletion of these worksheets is also possible. Numeric formatting feature lets you change the appearance of the numeric entries. Column width can be changed by using format, Column, Width options. Row height can be altered by using Format, Row, Height options. Alignment of data in your worksheet can be controlled. Borders tab in the format call dialog box enables you to apply borders. To choose a printer, to specify what to print and to set the number of copies, you have to open the print dialog box.

9.13 ANSWERS TO CHECK YOU PROGRESS

1) Cell range	2) three	3) Copying	4) T	5) T
6) Worksheet	7) All sheets	8) left	9) T	10)F

NOTES

9.14 QUESTIONS/EXERCISES

Section - A

1. Describe the various formatting of text in cells.
2. Explain how will you select worksheet items in Excel with example.
3. Explain how will you create formula in Excel with example.
4. Write the steps for creating formulas in Excel.

Section - B

5. How will you insert and delete rows and columns in Excel? Explain with example.
6. Describe the methods of adjusting column width and row height in Excel with example.

UNIVERSITY QUESTIONS

COMPUTER APPLICATIONS IN BUSINESS - MAY 2007

(For those who joined in July 2003 and after)

Time : Three hours   Maximum : 100 marks

SECTION A - (4 x 10 = 40 marks)

Answer any FOUR questions:

1. What are the characteristics features of Computers? Explain.
2. How will you plan and implement the MIS? Explain.
3. Define data processing. How does the term data differ from information?
4. Explain any two forms of input statements in BASIC with example.
5. Describe the method for entering labels in Lotus 1-2-3 cell with example.
6. Discuss any five built-in functions in Lotus 1-2-3 with example.
7. Explain any five buttons on picture toolbar in Word in detail.
8. How will you insert and delete rows and columns in Excel? Describe with examples.

SECTION - (3 x 20 = 60 marks)

Answer any THREE questions:

9. Draw a block diagram of a computer. Explain its components in detail.
10. Explain the elements and functions of MIS in detail.
11. What are the different business applications of data processing? Explain them in detail.
12. Describe the different types of loop statements in BASIC with example.
13. Explain the different methods for editing document text in Word.
14. (a) Discuss how will you create formula in Excel with example.

    (b) Describe how will you format numbers in different ways in Excel.

COMPUTER APPLICATIONS IN BUSINESS - OCTOBER 2008

(For those who joined in July 2003 and after)

Time : Three hours | Maximum : 100 marks

SECTION A - (4 x 10 = 40 marks)

Answer any FOUR questions:

1. Explain the memory unit with figure.
2. Describe the functions of MIS in an organization.
3. Define data processing. How does the term data differ from information?
4. Discuss any two forms of input statements in BASIC with example.
5. Write the required steps to change the column width of a cell in Lotus 1-2-3 with illustration.
6. Explain the steps for entering current data and time in Lotus 1-2-3 worksheet.
7. Discuss the method for setting margins in Word.
8. How will you insert and delete rows and columns in Excel? Describe with examples.

SECTION B - (3 x 20 = 60 marks)

Answer any THREE questions:

9. Explain the different stages involved in establishing the MIS in detail.
10. Discuss the various stages involved in data processing.
11. Describe the different types of loop statements in BASIC with example.
12. Explain the different parts in blank worksheet of Lotus 1-2-3 with neat diagram.
13. Discuss the different methods for indenting text in Word with examples.
14. Describe the various formatting options in Excel with example.